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Dietary
Guidelines
Advisory
Committee

Prepared for the
Committee by the
Agricultural
Research
Service

United States
Department of
Agriculture

August 2000

Report of the Dietary Guidelines Advisory Committee on the Dietary Guidelines for Americans, 2000

To the Secretary of Health and Human Services and the
Secretary of Agriculture

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Division of Nutritional Sciences

A Division of the New York State Colleges of Human Ecology and Agriculture and Life Sciences. Statutory Colleges of the State University of New York

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2 February, 2000

Dr. Donna Shalala, Secretary
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Washington, DC 20201

Dr. Dan Glickman, Secretary
U.S. Dept. of Agriculture
1400 Independence Avenue, SW
Whitten Bldg., Rm. 200A
Washington, DC 20250

Dear Secretaries Shalala and Glickman:

Enclosed is the report of the Dietary Guidelines Advisory Committee, "Report of the Dietary Guidelines Advisory Committee on the Dietary Guidelines for Americans, 2000"

I wish to take this opportunity to thank you on the committee's behalf. We recognize that our appointment represented a rare privilege to contribute meaningfully to the improvement of the health of all Americans and to the reduction of health disparities among our population. We are grateful for the trust reflected by your appointment of us to this important task.

The process of developing the report has been of enormous value to us individually and as a group. We learned much from reviewing the pertinent literature, listening carefully to input from a wide spectrum of stakeholders, and challenging each other's reasoning and conclusions. We hope that the outcome of these deliberations is similarly rewarding to the public whom they were intended to serve.

I also wish to recognize the staff assigned to the committee. We truly could not have completed our task without the dedicated staff that you made available to us. Special recognition must go to Dr. Carol Suitor. Her assistance was particularly valuable to us as we struggled to develop the very best report possible. We also would like to acknowledge the staff's work in preparing the material that appears in both appendices of this report.

As with other efforts of this type, this one was characterized by what I have come to call the four "C's:" Challenge, Complexity, Change, and Controversy. The scope and depth of the material that we were required to review presented the challenge. I am pleased to assure you that the committee addressed the challenge very ably. Meeting the challenge revealed the complexity of the task and the need for change. Complexity and change inevitably lead to some level of controversy. Although I am pleased that the scientific information on which our recommendations are based is the best that has ever been available to the Dietary Guidelines process, meeting our charge still required a significant amount of scientific judgement.

2 February, 2000

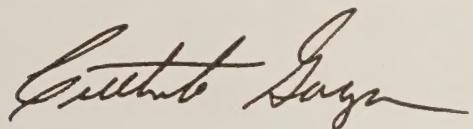
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Although the committee reviewed the evidence objectively, no doubt some voices will question our collective and individual objectivity. Recognizing this inevitability, I hope that the rationally based controversy will stimulate scientific research. I urge your departments to support research to enhance the information base for use by future Dietary Guideline Advisory Committees.

A "C" that we hope to avoid completely is confusion. I realize that complexity, change, and controversy are among the best ingredients for its creation. The committee worked extremely hard and, in my view, succeeded in minimizing the possibility of this outcome. However, the dissemination of this material and the adjunct educational activities undertaken to support it will be crucial to avoiding confusion. I stress this point because it is particularly difficult to avoid confusion in the area of nutrition. Much of this difficulty stems from what I euphemistically refer to as information de jour, i.e., the daily barrage of food and nutrition information directed to consumers that is taken out of context or possibly even misrepresented. To help overcome this problem, the committee stresses the need for your commitment to these ancillary efforts.

I look forward to the dialog our report will engender. Please feel free to call on my colleagues or me should any questions arise in your review of this document.

Sincerely,

A handwritten signature in black ink, appearing to read "Cutberto Garza".

Cutberto Garza M.D., Ph.D.
Chair
Dietary Guidelines Advisory Committee

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Charge to the Committee and Committee Activities

Public Law 101-445, Section 301 (7 U.S.C. 5341), directs the Secretaries of the U.S. Departments of Agriculture (USDA) and Health and Human Services (HHS) to issue jointly at least every 5 years a report entitled *Dietary Guidelines for Americans*. The law instructs that this publication shall contain nutritional and dietary information and guidelines for the general public, shall be based on the preponderance of scientific and medical knowledge current at the time of publication, and shall be promoted by each Federal agency in carrying out any Federal food, nutrition, or health program. The 1980, 1985, and 1990 editions were issued voluntarily by USDA and HHS. The 1995 edition was the first statutorily mandated report.

The Secretaries of USDA and HHS appointed jointly the Dietary Guidelines Advisory Committee to review the 1995 edition of the *Dietary Guidelines* and to determine if, on the basis of current scientific and medical knowledge, revisions were warranted. If so, the committee was to develop recommendations for revisions in a report to the Secretaries that would contain proposed text for the bulletins's fifth edition and rationale for the suggested modifications to the fourth edition.

The mandate to the committee is to advise the Secretaries of USDA and HHS; thus, the two Departments reserve the right to review and amend the text recommended by the committee prior to publication.

The committee served without pay under the regulations for Federal advisory committees. Its meetings, announced in the *Federal Register*, were open to the public and were held in accordance with the Federal Advisory Committee Act. Four public meetings were held by the committee in Washington, DC. (September, 1998; March, June, and September, 1999). Meeting transcripts and the final report of the committee are posted on the Internet at <http://www.ars.usda.gov/dgac>. Written comments from the public were received throughout the process. Oral comments were solicited during the second meeting of the committee held in March, 1999. About forty organizations provided oral testimony. A copy of the comments received were placed at the National Agricultural Library, Beltsville, Maryland.

Dietary Guidelines for Americans

Aim, Build, Choose—for Good Health

Eating is one of life's greatest pleasures. Since there are many foods and many ways to build a healthy diet and lifestyle, there is lots of room for choice. Use this booklet to help you and your family find ways to enjoy food while taking action for good health.

This booklet carries three basic messages—the ABCs for your health and that of your family:

- Aim for fitness
- Build a healthy base.
- Choose sensibly.

Ten guidelines point the way to good health. These guidelines are intended for healthy children (ages 2 years and older) and adults of any age.

Aim for fitness

- Aim for a healthy weight.
- Be physically active each day.

Following these two guidelines will help keep you and your family healthy and fit. Healthy eating and regular physical activity enable people of all ages to work productively, enjoy life, and feel their best. They also help children grow, develop, and do well in school.

Build a healthy base

- Let the Pyramid guide your food choices.
- Choose a variety of grains daily, especially whole grains.
- Choose a variety of fruits and vegetables daily.
- Keep food safe to eat.

Following these four guidelines builds a base for healthy eating. Let the Food Guide Pyramid guide you so that you get the nutrients your body needs each day. Make grains, fruits, and vegetables the foundation of your meals. This forms a base for good nutrition and good health and may reduce your risk of certain chronic diseases. Be flexible and adventurous—try new choices from these three groups in place of some less nutritious or higher calorie foods you usually eat. Whatever you eat, always take steps to keep your food safe to eat.

Choose sensibly

- Choose a diet that is low in saturated fat and cholesterol and moderate in total fat.

- Choose beverages and foods that limit your intake of sugars.
- Choose and prepare foods with less salt.
- If you drink alcoholic beverages, do so in moderation.

These four guidelines help you make sensible choices that promote health and reduce risk of certain chronic diseases. You can enjoy all foods as part of a healthy diet as long as you don't overdo on fat (especially saturated fat), sugars, salt, and alcohol. Read labels to identify foods that are high in saturated fats, sugars, and salt (sodium). Later sections of this booklet tell you how.

Aim, Build, Choose—for Good Health

By following the guidelines in this booklet, you can promote your health and reduce your risk for chronic diseases such as heart disease, certain cancers, diabetes, stroke, and osteoporosis. These diseases are leading causes of death and disability among Americans. Your food choices, your lifestyle, your environment, and your genes all affect your well-being. If you are at risk for a chronic disease, it is especially important to follow the 10 Dietary Guidelines in this booklet. So find out your family history of disease and your other risk factors for disease to make more informed decisions about how to improve your health.

The 10 guidelines in this booklet will help you take action for good health. The booklet tells you the reason each guideline is important and gives tips for following the guidelines. Use this booklet to find out some of the many ways to aim for fitness, to build a healthy base, and to choose sensibly. Try combining familiar and unfamiliar foods for enjoyable, healthy eating. Become physically active. And keep your food safe to eat.

Aim For Fitness

Aim for a healthy weight

Aiming for fitness involves two guidelines:

- Aim for a healthy weight.
- Be physically active each day (see page 4).

In other words, choose a lifestyle that combines sensible eating with regular physical activity. It's the key to good health.

To be at their best, adults need to avoid gaining weight, and many need to lose weight. Being overweight or obese increases your risk for high blood pressure, heart disease, stroke, diabetes, certain types of cancer, arthritis, and breathing problems. A healthy weight is key to a long, healthy life.

Evaluate your body weight

For adults and children, different methods are used to find out if weight is about right for height. If you are an adult, follow the directions in box 1 to evaluate your weight-for-height, or Body Mass Index (BMI). Not all adults who have a BMI in the range labeled "healthy" are at their most healthy weight. For example, some may have lots of fat and little muscle. A BMI above the healthy range is less healthy for most people; but it may be fine if you have lots of muscle, a large body frame, and little fat. The further your BMI is above the healthy range, the higher your weight-related risk (figure 1). If your BMI is above the healthy range, you may benefit from weight loss, especially if you have other health risk factors (see box 2). BMIs slightly below the healthy range may still be healthy unless they result from illness.

There is no single perfect body size for children. However, many children in the United States are overweight. If you have concerns about your child's body size, talk with your health care professional.

Keep track of your weight and your waist measurement, and take action if either of them increases. If your BMI is greater than 25, at least try to avoid further weight gain. If you are middle aged or elderly and your waist measurement increases, you are probably gaining fat and losing muscle. If so, take steps to eat less and become more active.

Box 1: Evaluate Your Weight (Adults)

1. Weigh yourself and have your height measured. Find your BMI category in figure 1. The higher your BMI category, the greater the risk for health problems.
2. Measure around your waist while standing, just above your hip bones. If it is greater than 35 inches for women or 40 inches for men, you probably have excess abdominal fat. This excess fat may place you at greater risk of health problems, even if your BMI is about right.
3. Use box 2 to find out how many other risk factors you have.

The higher your BMI and waist measurement, and the more risk factors you have from box 2, the more you are likely to benefit from weight loss.

NOTE: Weight loss is usually not advisable for pregnant women, people with certain psychiatric disorders, and people with serious illnesses like cancer.

Box 2: Find Out Your Other Risk Factors

The more of these risk factors you have, the more you are likely to benefit from weight loss if you are overweight or obese.

- Do you have a personal or family history of heart disease?
- Are you a male older than 45 years or a postmenopausal female?
- Do you smoke cigarettes?
- Do you have a sedentary lifestyle?
- Has your doctor told you that you have
 - high blood pressure?
 - abnormal blood lipids (high LDL cholesterol, low HDL cholesterol, high triglycerides)?
 - diabetes?

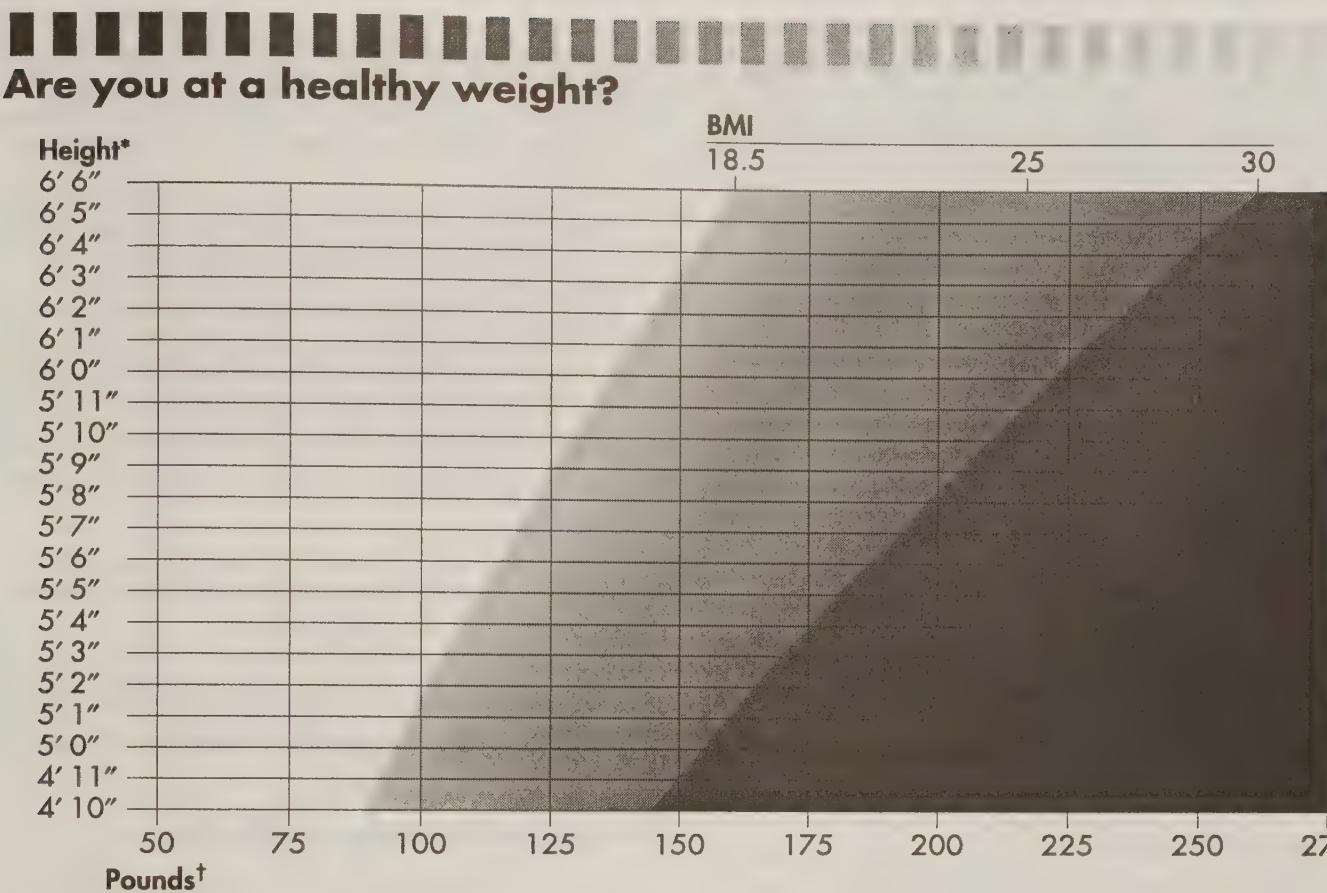
Manage your weight

Our genes affect our tendency to gain weight. A tendency to gain weight is increased when food is plentiful and when we use equipment and vehicles to save time and energy. Plentiful food and labor-saving devices can make it very difficult to avoid weight gain, but it is possible to manage your weight through your food and physical activity choices.

To make it easier to manage your weight, make long-term changes in your eating behavior and physical activity. To do this, build a healthy base and make sensible choices. Choose a healthful assortment of foods that includes vegetables, fruits, grains (especially whole grains), skim milk, and fish, lean meat, poultry, or beans. Choose foods that are low in fat and added sugars most of the time. Eating mainly vegetables, fruits, and grains helps you feel full, achieve good health, and manage your weight. Whatever the food, eat a sensible portion size (see box 3, page 3).

Try to be more active throughout the day (see next guideline). To maintain a healthy weight after weight loss, it helps for adults to do at least 45 minutes of moderate physical activity daily (at least 60 minutes daily for children). Over time, even a small decrease in calories eaten and a small increase in physical activity can keep you from gaining weight or help you lose weight.

Figure 1: Are You At A Healthy Weight?



Healthy Weight ■ **Overweight** ■ **Obesity**

* Without shoes. † Without clothes.

The BMI (weight-for-height) ranges shown above for adults. They are not exact ranges of healthy and unhealthy weights. However, they show that health risk increases at higher levels of overweight and obesity. Even within the healthy BMI range, weight gains can carry health risks for adults.

Directions: Find your weight on the bottom of the graph. Go straight up from that point until you come to the line that matches your height. Then look to find your weight group.

- > BMI of 25 defines the upper boundary of healthy weight
- > BMI of higher than 25 to 30 defines overweight
- > BMI of higher than 30 defines obesity

Box 3: Choose Sensible Portion Sizes

- Control portion size. See guideline “Let the Pyramid guide your food choices” page XX , for sensible sizes and numbers of servings. If you’re eating out, choose small portion sizes, share an entree with a friend, or take part of the food home (if you can chill it right away). Many items sold as single servings actually provide 2 servings or more. Examples include a 20-ounce container of soft drink, a 12-ounce steak, a 3-ounce bag of chips, and a large bagel.
- Be especially careful to limit portion size of foods high in calories, such as cookies, cakes, other sweets, French fries, and fats.

High-fat foods contain more calories than the same amount of other foods, so they can make it difficult for you to avoid excess calories. However, *low fat* doesn’t always mean low calorie. Sometimes extra sugars are added to low-fat muffins or desserts, for example, and they may be very high in calories.

Your pattern of eating may be important. Snacks and meals eaten away from home provide a large part of daily calories for many people. Choose them wisely. Try fruits, vegetables, whole grain foods, or a cup of low-fat milk or yogurt for a snack. When eating out, choose small portions of foods. If you choose fish, poultry, or lean meat; ask that it be grilled rather than fried.

Like younger adults, overweight and obese older adults can improve their health by losing weight. The guidance of

a health professional is recommended for obese children and older adults. Since older people tend to lose muscle and replace it with fat, regular weight-bearing physical activity is a valuable part of a weight-loss plan. Building or maintaining muscle helps keep older adults active and reduces their risk of falls and fractures. Staying active throughout your adult years helps maintain muscle mass and bone strength for your later years.

If you need to lose weight, do so gradually

If you are overweight, loss of 5 to 15 percent of your body weight is likely to improve your health, ability to function, and quality of life. Aim to lose about 10 percent of your weight over about 6 months. This would be 20 pounds of weight loss for someone who weighs 200 pounds. Loss of 1/2 to 2 pounds per week is usually safe. Even if you have regained weight in the past, it's worthwhile to try again. However, your health is more likely to improve over the long term if you achieve and maintain a healthy weight rather than lose and regain many times. Staying at a healthy weight requires healthy eating habits and physical activity as a regular part of your life.

Encourage healthy weight in children

Children need enough food for proper growth, but too many calories and too little physical activity lead to obesity. The number of overweight U.S. children has risen dramatically in recent years. Encourage healthy weight by offering children grain products; vegetables and fruits; low-fat dairy products; and beans, lean meat, poultry, fish, or nuts—and let them see you enjoy eating the same foods. Let the child decide how much of these foods to eat. Offer only small amounts of foods high in fat or added sugars. Encourage children to take part in vigorous activities (and join them whenever possible). Limit the time they spend in sedentary activities like watching television or playing computer or video games.

Take care when helping overweight children to develop healthy eating habits. Make small changes. For example, serve low-fat milk rather than whole milk and offer one cookie instead of two. Since children still need to grow, weight loss is not recommended unless guided by a health care professional.

Serious eating disorders

Frequent binge eating, with or without periods of food restriction, may be a sign of a serious eating disorder. Other signs of eating disorders include preoccupation with body weight or food (or both—regardless of body weight), dramatic weight loss, excessive exercise, self-induced vomiting, and the abuse of laxatives. Seek help from a health care professional if any of these apply to you, a family member, or a friend.

Advice For Today

- Aim for a healthy weight. If you are at a healthy weight, aim to avoid weight gain. If you are already overweight, first aim to prevent further weight gain, and then lose weight to improve your health.
- Build a healthy base by eating vegetables, fruits, and grains (especially whole grains). If you eat these foods with little added fat or sugar, they will help you feel comfortably full without a lot of calories. Select sensible portion sizes.
- In addition, get moving. That is, make sure you get regular physical activity.
- Set a good example for children by practicing healthy eating habits and enjoying regular physical activities together.
- Keep in mind that even though heredity and the environment are important influences, your behaviors help determine your body weight.

Aim For Fitness

Be physically active each day

Being physically active and maintaining a healthy weight are both needed for fitness, but they benefit health in different ways. Children, teens, adults, elderly—all can improve their health and well being and have fun by including moderate amounts of physical activity in their daily lives. Physical activity involves moving the body. A moderate physical activity is any activity that requires about as much energy as walking 2 miles in 30 minutes.

Aim to accumulate at least 30 minutes of physical activity daily. If you already get 30 minutes of physical activity daily, you can gain even more health benefits by increasing the amount of time that you are physically active or by taking part in more vigorous activities. No matter what activity you choose, you can do it all at once, or spread it out over two or three times during the day.

Make physical activity a regular part of your routine

Choose activities that you enjoy and that you can do regularly (see box 4). Some people prefer activities that fit into their daily routine, like gardening or taking extra trips up and down stairs. Others prefer a regular exercise program, such as a physical activity program at their worksite. Some do both. The important thing is to be physically active every day.

Most adults do not need to see their health care professional before starting to become more physically active. However, if you are planning to start a vigorous activity plan

and have one or more of the conditions below, consult your health care professional:

- Chronic health problem such as heart disease, hypertension, diabetes, or obesity
- High risk for heart disease
- Over age 40 for men or 50 for women.

Box 4: Examples Of Physical Activities For Adults

For at least 30 minutes most days of the week, do any one of the activities listed below—or combine activities. Look for additional opportunities among other activities that you enjoy.

As part of your routine activities

- Walk or bike ride more, drive less.
- Walk up stairs instead of taking an elevator.
- Get off the bus a few stops early and walk the remaining distance.
- Mow the lawn with a manual mower.
- Rake leaves.
- Garden.
- Wheel self in wheelchair (if wheelchair bound).
- Push a stroller.
- Clean the house.
- Do exercises or pedal a stationary bike while watching television.
- Play actively with children.
- Take a brisk 10-minute walk in the morning, at lunch, and after dinner.

As part of your exercise or recreational routine

- Walk.
- Bicycle.
- Swim or do water aerobics.
- Play racket sports.
- Golf (pull cart or carry clubs).
- Canoe.
- Play basketball.
- Dance.
- Take part in an exercise program at work, home, school, or gym.

Health benefits of physical activity

Compared with being very sedentary, being physically active for at least 30 minutes on most days of the week reduces the risk of developing or dying of heart disease. It has other health benefits as well (see box 5). No one is too young or too old to enjoy the benefits of regular physical activity.

Two types of physical activity are especially beneficial:

- *Aerobic activities.* These are activities that speed your heart rate and breathing. They help cardiovascular fitness. See box 4 for examples.
- *Activities for strength and flexibility.* Developing strength may help build and maintain your bones. Carrying groceries and lifting weights are two strength-building activities. Gentle stretching, dancing, or yoga can increase flexibility.

Box 5: Health Benefits Of Regular Physical Activity

- Increases physical fitness
- Helps build and maintain healthy bones, muscles, and joints
- Builds endurance and muscular strength
- Helps manage weight
- Lowers risk factors for cardiovascular disease, colon cancer, and type 2 diabetes
- Helps control blood pressure
- Promotes psychological well-being and self-esteem
- Reduces feelings of depression and anxiety

To get these health benefits, adults need a moderate amount of physical activity for a total of at least 30 minutes most days of the week, and children need at least 60 minutes per day.

Physical activity and nutrition

Physical activity and nutrition work together for better health. For example, physical activity increases the amount of calories you use. For those who have intentionally lost weight, being active makes it easier to maintain the weight loss. However, 30 minutes of activity daily may not be enough to lose weight or maintain weight loss. Read the preceding guideline “Aim for a Healthy Weight,” for more information about weight management.

Physical activity and nutrition work together in more ways than weight management. By increasing the calories you use, it also is easier to get the nutrients you need. Physical activity and nutrition work together for bone health, too. Calcium and other nutrients are needed to build and maintain strong bones, but physical activity is needed as well.

Help children be physically active

Children and adolescents benefit from physical activity in many ways (see box 6). They need at least 60 minutes of physical activity daily. Parents can help:

- Set a good example. For example, arrange active family events in which everyone takes part. Join your children in physical activities.
- Encourage your children to be physically active at home, at school, and with friends by jumping rope, playing tag, riding a bike.
- Limit television watching, computer games, and other inactive forms of play by alternating with periods of physical activity.

Box 6: Physical Activities For Children And Teens

Aim for at least 60 minutes total per day

- Be spontaneously active.
- Play tag.
- Jump rope.
- Ride a bicycle or tricycle.
- Play actively during school recess.
- Roller skate or blade.
- Take part in physical education activity classes during school.
- Join after-school or community physical activity programs.
- Dance.

Older people need to be physically active too

Older persons also need to be physically active. Engage in moderate physical activity for at least 30 minutes a day, and take part in activities to strengthen muscles and to improve flexibility. Staying strong and flexible can reduce your risk of falling and breaking bones, preserve muscle, and improve your ability to live independently. Lifting small weights and carrying groceries are two ways to include strength building into your routine.

Advice For Today

- Engage in 30 minutes or more of moderate physical activity most, preferably all, days of the week.
- Become physically active if you are inactive.
- Maintain or increase physical activity if you are already active.
- Stay active throughout your life.
- Help children get at least 60 minutes of physical activity daily.
- Choose physical activities that fit in with your daily routine, or choose recreational or structured exercise programs, or both.

- Consult your health care professional when starting a new vigorous physical activity plan if you have heart disease or a related health problem.

Build A Healthy Base

Let the Pyramid guide your food choices

Different foods contain different nutrients and other healthful substances. No single food can supply all the nutrients in the amounts you need. For example, oranges provide vitamin C and folate but no vitamin B₁₂; cheese provides calcium and vitamin B₁₂ but no vitamin C. To make sure you get all the nutrients and other substances you need for health, build a healthy base by using the Food Guide Pyramid (figure 2) as a starting point. Choose the recommended number of daily servings from each of the five major food groups (box 7). If you avoid all foods from any of the five food groups, seek guidance to help ensure that you get all the nutrients you need.

Box 7: How Many Servings Do You Need Each Day?

Food group	Children ages 2 to 6 years, women, some older adults (about 1,600 calories)*	Older children, teen girls, active women, (about 2,800 most men calories)*	Teen boys, active men (about 2,200 calories)*
Bread, rice, cereal, pasta (grains) group, especially whole grain	6	9	11
Vegetable group	3	4	5
Fruit group	2	3	4
Milk, yogurt, and cheese (dairy) group—preferably fat free or low fat	2–3**	2–3**	2–3**
Dry beans, eggs, nuts, fish, and meat and poultry group—preferably lean or low fat	2, for a total of 5 ounces	2, for a total of 6 ounces	3, for a total of 7 ounces

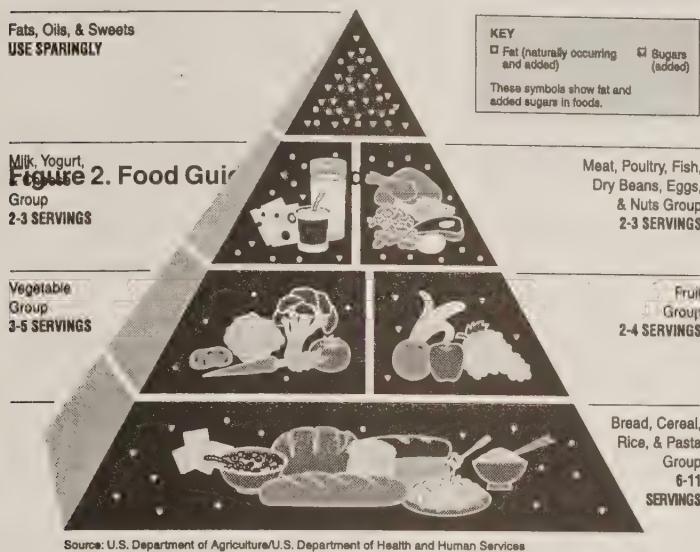
Adapted from U.S. Department of Agriculture, Center for Nutrition Policy and Promotion. The Food Guide Pyramid, Home and Garden Bulletin Number 252, 1996.

*These are the calorie levels if you choose low-fat, lean foods from the 5 major food groups and if you use foods from the fats, oil, and sweets group sparingly.

**Older children and teenagers (ages 9 to 18 years) and adults over the age of 50 need 3 servings daily. During pregnancy and lactation, the recommended number of dairy group servings is the same as for nonpregnant women.

Food Guide Pyramid

A Guide to Daily Food Choices



Use plant foods as the foundation of your meals

There are many ways to create a healthy eating pattern, but they all start with the three food groups at the base of the Pyramid: grains, fruits, and vegetables. Eating a variety of grains (especially whole grain foods), fruits, and vegetables is the basis of healthy eating. Enjoy meals that have rice, pasta, tortillas, or whole grain bread at the center of the plate, accompanied by plenty of fruits and vegetables and moderate amounts of low-fat foods from the dairy group and the meat and beans group. Go easy on foods high in fat or sugars.

Keep an eye on servings

Compare the recommended number of servings in box 7 and the serving sizes in box 8 with what you usually eat. If you don't need many calories (because you're inactive, for example), aim for the lower number of servings. Notice that some of the serving sizes in box 8 are smaller than what you might usually eat. For example, many people eat 2 slices of bread in a meal, which equal 2 servings. So it's easy to exceed the recommended number of servings.

Also notice that many of the meals and snacks you eat contain items from several food groups. For example, a sandwich may provide bread from the grains group, turkey from the meat and beans group, and cheese from the dairy group.

Choose a variety of foods within each food group for good nutrition. Since foods within the same food group differ in their content of nutrients and other beneficial substances, choosing a variety helps you get all the nutrients and fiber you need. It can also help keep your meals interesting from day to day.

Box 8: What Counts As A Serving?

Bread, Cereal, Rice, and Pasta Group (Grains Group)—whole grain and refined

- 1 slice of bread
- About 1 cup of ready-to-eat cereal flakes
- 1/2 cup of cooked cereal, rice, or pasta

Fruit Group

- 1 medium apple, banana, orange, pear
- 1/2 cup of chopped, cooked, or canned fruit
- 3/4 cup of fruit juice

Vegetable Group

- 1 cup of raw leafy vegetables
- 1/2 cup of other vegetables—cooked or raw
- 3/4 cup of vegetable juice

Milk, Yogurt, and Cheese Group (Dairy Group)*

- 1 cup of milk** or yogurt**
- 1 1/2 ounces of natural cheese** (such as cheddar)
- 2 ounces of processed cheese** (such as American)
- 1 cup of soy-based beverage with added calcium

Meat, Poultry, Fish, Dry Beans*, Eggs, and Nuts Group (Meat and Beans Group)

- 2–3 ounces of cooked lean meat, poultry, or fish
- 1/2 cup of cooked dry beans or 1/2 cup of tofu counts as 1 ounce of lean meat
- 2 1/2 ounce soyburger or 1 egg counts as 1 ounce of lean meat.
- 2 tablespoons of peanut butter or 1/3 cup of nuts counts as 1 ounce of meat

NOTE: Many of the serving sizes given above are smaller than those on the Nutrition Facts Label. For example, 1 serving of cooked cereal, rice, or pasta is 1 cup for the label but only 1/2 cup for the Pyramid.

* This includes lactose-free and lactose-reduced dairy products.

** Choose fat-free or reduced fat dairy products most often.

* Dry beans, peas, and lentils can be counted as servings in either the meat and beans group or the vegetable group. As a vegetable, 1/2 cup of beans counts as 1 serving. As a meat substitute, 1 cup of beans counts as 1 serving.

There are many healthful eating patterns

Different people like different foods and like to prepare the same foods in different ways. Culture, family background, religion, moral beliefs, the cost and availability of food, life experiences, food intolerances, and allergies affect people's food choices. Use the Food Guide Pyramid as a starting point to shape your eating pattern. It provides a good guide to make sure you get enough nutrients. Make choices from each major group in the Food Guide Pyramid, and combine them however you like. For example, those who like Mexican cuisine might choose tortillas from the grains group and beans from the meat and beans group, while those who eat Asian food might choose rice from the grains group and tofu from the meat and beans group.

However, if you usually avoid all foods from one or two of the food groups, be sure to get enough nutrients from other food groups. For example, if you choose not to eat dairy products because of intolerance to lactose or for other reasons, choose other foods that are good sources of calcium (see box 9), and be sure to get enough vitamin D. If you choose to avoid all or most animal products, be sure to get enough iron, vitamin B₁₂, calcium, and zinc.

Growing children, teenagers, women, and older adults have higher needs for some nutrients

Adolescents and adults over age 50 have an especially high need for calcium, but most people need to eat plenty of good sources of calcium for healthy bones throughout life. When selecting dairy products to get enough calcium, choose those that are low in fat or fat free to avoid getting too much saturated fat. Young children, teenage girls, and women of childbearing age need enough good sources of iron, such as lean meats and cereals with added nutrients, to keep up their iron stores (box 10). Women who could become pregnant need extra folic acid, and older adults need extra vitamin D.

Box 9: Some Sources Of Calcium*

- Most foods in the dairy group**. *
 - yogurt
 - milk
 - natural cheeses such as mozzarella, cheddar, Swiss, and parmesan
 - soy-based beverage with added calcium
- Tofu, if made with calcium sulfate (read the label)
- Breakfast cereal with added calcium (iron content varies)
- Canned fish with soft bones such as salmon, sardines^y
- Fruit juice with added calcium
- Pudding made with milk
- Soup made with milk
- Dark-green leafy vegetables such as collards, turnip greens

* Read food labels for brand-specific information. The foods at the top of this list are highest in calcium per serving.

** This includes lactose-free and lactose-reduced dairy products.

^y Choose low-fat or fat-free dairy products most often.

^{*} High in salt.

Box 10: Some Sources Of Iron*

- Shellfish, like shrimp, clams, mussels, and oysters
- Lean meats (especially beef), liver** and other organ meats**
- Ready-to-eat cereals with added nutrients (amount varies)
- Turkey dark meat without skin
- Sardines^y, anchovies^y
- Spinach
- Cooked dry beans (such as kidney beans), peas (such as black-eyed peas), and lentils.
- Enriched and whole grain breads

* Read food labels for brand-specific information. The foods at the top of this list are highest in iron per serving.

** Very high in cholesterol.

^y High in salt.

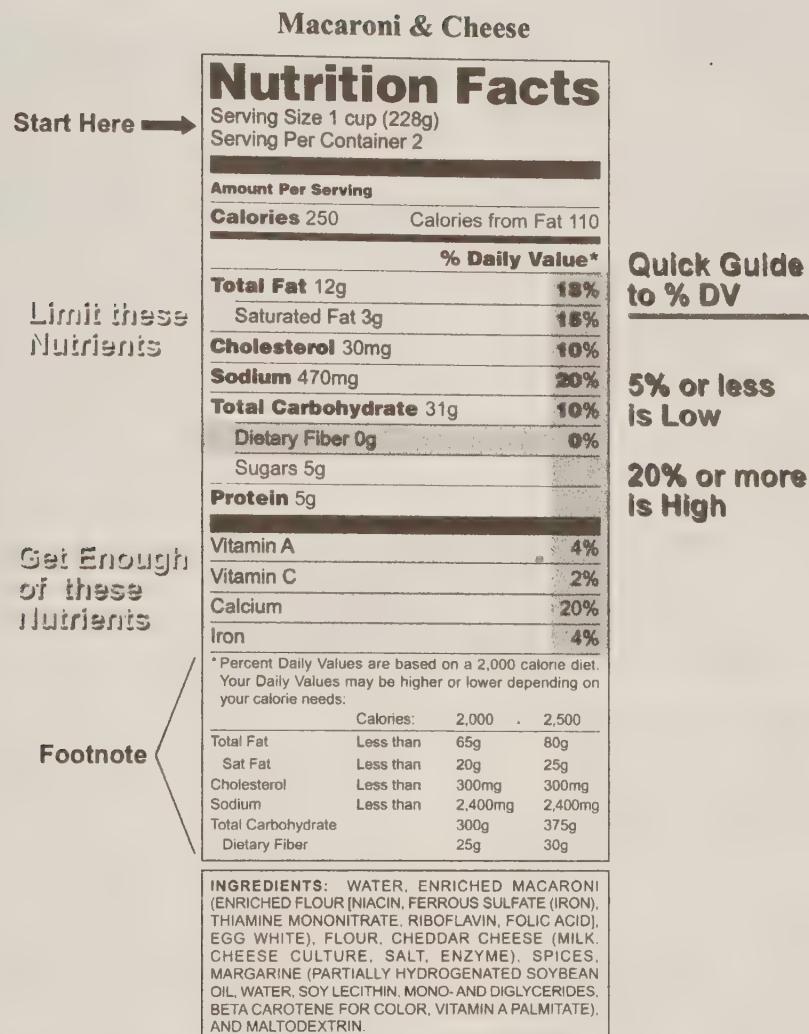
Check the food label before you buy

Labels have several parts including the front panel, Nutrition Facts, and ingredient list. The front panel often tells you if nutrients have been added—for example, “iodized salt” lets you know that iodine has been added, and “enriched pasta” (or “enriched” grain of any type) means that thiamin, riboflavin, niacin, iron, and folic acid have been added.

The ingredient list tells you what's in the food, including any nutrients, fats, or sugars that have been added. The ingredients are listed in descending order by weight.

See figure 3 to learn how to read the Nutrition Facts. Use the Nutrition Facts to see if a food is a good source of a nutrient or to compare different foods—for example, to find which brand of frozen dinner is lower in saturated fat, or which kind of breakfast cereal contains more folic acid. Look at the % Daily Value (%DV) column to see whether a food is high (20% or more) or low (5% or less) in nutrients. If you want to limit a nutrient (such as fat, saturated fat, cholesterol, sodium), try to choose foods with 5%DV or less. If you want to consume more of a nutrient (such as calcium, other vitamins and minerals, fiber), try to choose foods with a higher %DV.

Figure 3 How to Read a Food Label



Some people need a vitamin/mineral supplement

Some people need a vitamin-mineral supplement to meet specific nutrient needs. For example, older adults and people with little exposure to sunlight may need a vitamin D supplement. To reduce risk of a birth defect, women who could become pregnant are advised to eat foods high in folic acid or to take a folic acid supplement. Pregnant women are advised to take an iron supplement. Adults over age 50 are advised to get their vitamin B₁₂ from a supplement or from fortified foods. People who seldom eat dairy products or other rich sources of calcium need a calcium supplement. People who eat no animal foods need to take a vitamin B₁₂ supplement. People on very low calorie diets may need a multivitamin-mineral supplement. Sometimes vitamins or minerals are prescribed for meeting nutrient needs or for therapeutic purposes.

Supplements of some nutrients, such as vitamin A and selenium, can be harmful if taken in large amounts. Because foods contain many substances that promote health, use the

Food Guide Pyramid when choosing foods. Don't depend on supplements to meet your usual nutrient needs.

Dietary supplements now include vitamins, minerals, fiber, herbal products, and many other substances offered in over-the-counter forms. Herbal products usually provide very small amounts of essential nutrients. The value of most herbal products for health has not been established. At this time, there are few standards for their purity or potency.

Advice For Today

- Build a healthy base: use the Food Guide Pyramid to help you make healthy food choices that you can enjoy.
- Build your eating pattern on a variety of plant foods, including whole grains, fruits, and vegetables.
- Also choose some low-fat dairy products and low-fat foods from the meat and beans group each day. It's fine to enjoy fats and sweets occasionally.

Build A Healthy Base

Choose a variety of grains daily, especially whole grains

Foods made from grains (like wheat, rice, and oats) are the foundation of a nutritious diet. They provide vitamins, minerals, carbohydrates (starch and dietary fiber), and other substances that are important for good health. Grain products are low in fat, unless fat is added in processing, in preparation, or at the table. Whole grains differ from refined grains in the amount of fiber and nutrients they provide, and different whole grain foods differ in nutrient content, so choose a variety. If you eat plenty of whole grains, such as whole wheat bread or oatmeal (see box 11), you may reduce your risk of coronary heart disease, bowel diseases, and possibly some types of cancer. Aim for at least 6 servings per day—more if you are very active—and include several servings of whole grain foods. See box 8 for serving sizes.

Why choose whole grain foods?

Vitamins, minerals, fiber, and other protective substances in whole grain foods contribute to the health benefits of whole grains. Refined grains are low in fiber and in the protective substances that accompany fiber. Eating plenty of fiber-containing foods, such as whole grains (and also many fruits and vegetables) promotes proper bowel function. The high fiber content of many whole grains may also help you to feel full with fewer calories. Fiber is best obtained from foods like whole grains, fruits, and vegetables rather than from fiber supplements for several reasons: there are many types of fiber, the composition of fiber is poorly understood, and other protective substances accompany fiber in foods. Use the Nutrition Facts Label to help choose grains that are rich in fiber and low in saturated fat and sodium.

Box 11: How To Increase Your Intake Of Whole Grain Foods

Choose foods that name one of the following ingredients *first* on the label's ingredient list (see sample in figure 4).

- brown rice
- bulgher
- cracked wheat
- graham flour
- oatmeal
- popcorn
- whole barley
- whole cornmeal
- whole oats
- whole rye
- whole wheat

Try some of these whole grain foods: whole wheat bread, whole grain ready-to-eat cereal, low-fat whole wheat crackers, oatmeal, corn tortillas, whole-wheat pasta, whole barley in soup, tabouli salad.

NOTE: "Wheat flour," "enriched flour," and "degerminated corn meal" are not whole grains.

Figure 4: Sample Ingredient List For A Whole Grain Food

Ingredients: Whole Wheat Flour, Water, High Fructose Corn Syrup, Wheat Gluten, Soybean And/Or Canola Oil, Yeast, Salt, Honey

Enriched grains are a new source of folic acid

Folate, also called folic acid, is a B vitamin that reduces the risk of serious types of birth defects and may help protect against coronary heart disease and possibly certain cancers. Folic acid is now added to all enriched grain products (thiamin, riboflavin, niacin, and iron have been added to enriched grains for many years). Whole grain foods naturally contain some folate, but only a few (mainly ready-to-eat breakfast cereals) contain added folic acid as well. Read the ingredient label to find out if folic acid has been added, and check Nutrition Facts to compare the nutrient content of foods like breakfast cereals.

Advice For Today

- Build a healthy base by making a variety of grains the foundation of your diet.
- Eat 6 or more servings of grain products daily (whole grain and refined breads, cereals, pasta, and rice). Include several servings of whole grain foods daily for their good taste and their health benefits. If your calorie needs are low, have only 6 servings of sensible size daily (see box 8 for examples of serving sizes).
- Eat foods made from a variety of whole grains—such as whole wheat, brown rice, oats, and whole corn—every day.
- Combine whole grains with other tasty, nutritious foods in mixed dishes.
- Prepare or choose grain products with little added saturated fat and moderate or low amounts of added sugars. Also, check the sodium content on the Nutrition Facts Label.

Build A Healthy Base

Choose a variety of fruits and vegetables daily

Fruits and vegetables are key parts of your daily diet. Eating plenty of fruits and vegetables of different kinds may help protect you against heart disease, stroke, and some types of cancer. It also promotes healthy bowel function. Fruits and vegetables provide essential vitamins and minerals, fiber, and other substances that are important for good health. Most people, including children, eat fewer servings of fruits and vegetables than are recommended. To promote your health, eat a variety of fruits and vegetables—at least 2 servings of fruits and 3 servings of vegetables—each day.

Why eat plenty of different fruits and vegetables?

Different fruits and vegetables are rich in different nutrients (box 12). Some fruits and vegetables are excellent sources of vitamin A (carotenoids), while others may be rich in vitamin C, folate, or potassium. They also contain fiber and other substances that are associated with good health. Dark green leafy vegetables, deeply colored fruits, and dried peas and beans are especially rich in many nutrients. Most fruits and vegetables are low in calories and filling. Some are high in fiber, and many are quick to prepare and easy to eat. Eating plenty of fruits and vegetables makes it easier to

Box 12: Which Fruits And Vegetables Provide The Most Nutrients?

The lists below show which fruits and vegetables are the best sources of vitamin A (carotenoids), vitamin C, folate, and potassium. Often, the brighter the color, the higher the content of vitamins and minerals. Eat at least 2 servings of fruits and at least 3 servings of vegetables each day:

Sources of vitamin A (carotenoids)

- Bright orange vegetables like carrots, sweet potatoes, pumpkin
- Dark-green leafy vegetables such as spinach, collards, turnip greens
- Bright orange fruits like mango, cantaloupe, apricots

Sources of vitamin C

- Citrus fruits and juices, kiwi, strawberries, and cantaloupe
- Broccoli, peppers, tomatoes, cabbage, and potatoes
- Leafy greens such as romaine, turnip greens, and spinach

Sources of folate

- Cooked dried beans and peas
- Oranges, orange juice
- Deep green leaves like spinach and mustard greens

Sources of potassium

- Baked white or sweet potato, cooked greens (such as spinach), winter (orange) squash
- Bananas, plantains, many dried fruits, orange juice

avoid getting too many calories. Choose whole or cut up fruits and vegetables rather than juices most often. Juices contain little or no fiber.

Aim for variety

Try many colors and kinds. Choose any form: fresh, frozen, canned, dried, juices. All forms provide vitamins and minerals, and all provide fiber except for most juices—so choose fruits and vegetables rather than juices most often. Wash fresh fruits and vegetables thoroughly before using. If you buy prepared vegetables, check the Nutrition Facts Label to find choices that are low in saturated fat and sodium.

Try serving fruits and vegetables in new ways:

- raw vegetables with dip
- vegetables stir-fried in a small amount of vegetable oil
- fruits or vegetables mixed with other foods in salads, casseroles, soups, sauces (for example, add shredded vegetables when making meatloaf).

Find ways to include plenty of different fruits and vegetables in your meals and snacks.

- Buy wisely: Frozen or canned fruits and vegetables are sometimes best buys, and they are rich in nutrients. If fresh fruit is very ripe, buy only enough to use right away.
- Store properly to maintain quality. Refrigerate most fresh fruits (not bananas) and vegetables (not potatoes or tomatoes) for longer storage, and arrange them so you'll use up the ripest ones first. If you cut them up or open a can, refrigerate afterward.
- Keep ready-to-eat raw vegetables handy in a clear container in the front of your refrigerator for snacks or meals-on-the-go.
- Keep a day's supply of fresh or dried fruit handy on the table or counter.
- Enjoy fruits as a naturally sweet end to a meal.
- When eating out, choose a variety of vegetables at a salad bar.

Advice For Today

Eat at least 2 servings of fruit and at least 3 servings of vegetables each day (see box 8 for serving sizes). Choose fresh, frozen, dried, or canned forms and a variety of colors and kinds. Choose dark-green leafy vegetables, bright orange fruits and vegetables, and cooked dried peas and beans often.

NOTE: Read Nutrition Fact Labels for product-specific information, especially for processed fruits and vegetables.

Build A Healthy Base

Keep food safe to eat

Foods that are safe from harmful bacteria, viruses, parasites, and chemical contaminants are vital for healthful eating. *Safe* means that the food poses little risk of foodborne illness (box 13). Farmers, food producers, markets, and food preparers have a legal obligation to keep food safe, but we also need to keep foods safe in the home.

Box 13: What Is Foodborne Illness?

Foodborne illness can be caused by eating food that contains harmful bacteria, toxins, parasites, viruses, or chemical contaminants. Bacteria, especially *Campylobacter* and *Salmonella*, are among the most common sources of foodborne illness we know about today. Eating even a small portion of an unsafe food may make you sick. Signs and symptoms may appear within half an hour of eating a contaminated food or may not develop for up to 2 weeks. Most foodborne illness lasts a few hours or days. Some foodborne illnesses have effects that go on for weeks, months, or even years. If you think you have become sick from eating a food, write down what you ate in the last 1 to 3 days, where you ate, your symptoms, and when you became ill. Keep a well-marked sample of the suspicious food in your freezer. (Don't let anyone eat it!) Then consult your health care professional.

Follow the steps below to keep your food safe. Be very careful with perishable foods that require special care (foods containing eggs, meats, poultry, fish, shellfish, or milk products). If you are at high risk of foodborne illness, be extra careful (see box 14).

Box 14: Tips For Those At High Risk Of Foodborne Illness

Who is at high risk of foodborne illness?

- Pregnant women
- Young children
- Older persons
- People with weak immune systems

What extra precautions should they take?

Besides following the guidance below, those at high risk should

- Avoid raw (unpasteurized) juices and sprouts
- Eat ground meat, fish, and shellfish (clams, oysters, scallops and mussels) only if fully cooked.

Clean. Wash hands and surfaces often

Wash your hands with hot soapy water for 20 seconds (count to 30) before you handle food or food utensils. Use a plastic or other nonporous surface as a cutting board. Wash your hands after handling or preparing food, especially after handling raw meat, poultry, fish, shellfish, or eggs. Right after you prepare these raw foods, clean the utensils and surfaces you used with hot soapy water. Wash raw fruit and vegetables with warm water before eating. Use a small scrub brush to remove surface dirt if necessary. Always wash your hands after using the bathroom, changing diapers, or playing with pets.

Separate. Separate raw, cooked, and ready-to-eat foods while shopping, preparing, or storing

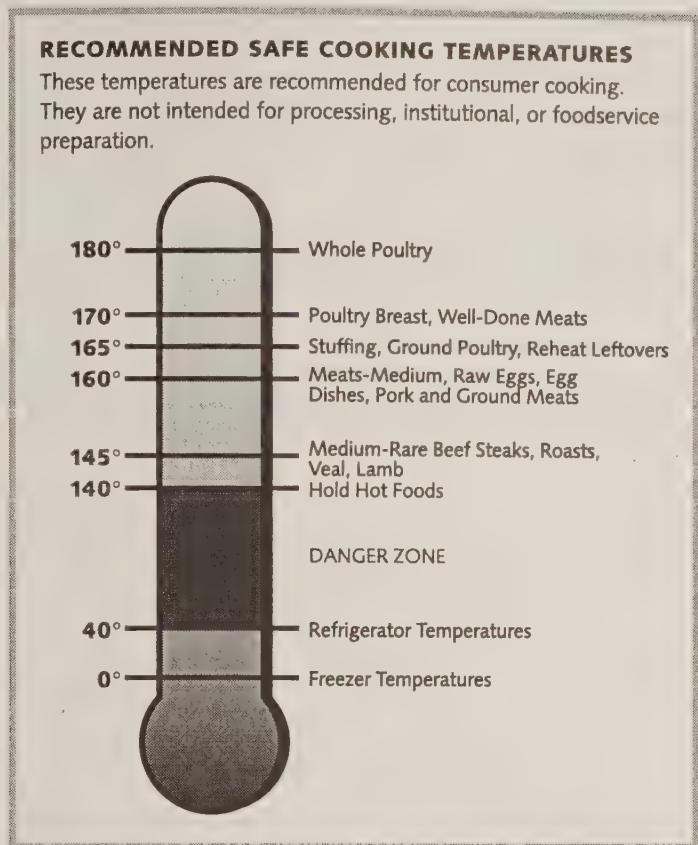
Keep raw meat, poultry, eggs, fish, and shellfish away from contact with other foods, surfaces, utensils, or serving plates. This prevents cross-contamination from one food to another. Store raw meat, poultry, fish, and shellfish in a container in the refrigerator so that the juices don't drip onto other foods.

Cook. Cook food to a safe temperature

Uncooked and undercooked animal foods are potentially unsafe. Proper cooking makes most uncooked foods safe. The best way to tell if meat, poultry, or egg dishes are cooked to a safe temperature is to use a thermometer (figure 5). Several kinds of inexpensive thermometers are available in many markets.

Reheat sauces, soups, marinades, and gravies to a rolling boil. Reheat leftovers thoroughly to at least 165° F, and reheat them only once. If using a microwave oven, turn or stir the food to make sure it is heated evenly throughout. Do not warm infant formula in the microwave. Cook eggs until whites and yolks are firm. Don't eat raw or partially cooked eggs, or foods containing raw eggs, raw (unpasteurized) milk, or cheeses made with raw milk. Choose pasteurized juices. The risk of contamination is high from rare hamburger, raw fish (including sushi), clams, and oysters. Cook fish and shellfish until it is opaque; fish should flake easily with a fork.

Figure 5. Cook foods to a safe temperature



Chill. Refrigerate perishable foods promptly

At home, refrigerate or freeze meat, poultry, eggs, fish, shellfish, ready-to-eat foods and leftovers promptly. Refrigerate within 2 hours of purchasing or preparation—and within 1 hour if the air temperature is above 90° F. Use refrigerated leftovers within 3 to 4 days. Freeze fresh meat, poultry, fish, and shellfish that cannot be used in a few days. Thaw frozen meat, poultry, fish, and shellfish in the refrigerator, microwave, or cold water changed every 30 minutes. (This keeps the surface chilled.) Never thaw meat, poultry, fish, or shellfish at room temperature.

Follow the label

When shopping, buy perishable foods last, and take them straight home to the refrigerator or freezer. Read the package label and follow safety instructions on the package such as "KEEP REFRIGERATED" and the "SAFE HANDLING INSTRUCTIONS."

Serve safely

Serve meat, poultry, eggs, fish, and shellfish right away—just before eating—and chill leftovers as soon as you are finished. Keep hot foods hot (above 140° F) and cold foods cold (below 40° F). Whether raw or cooked, never leave meat, poultry, eggs, fish, or shellfish out at room temperature for more than 2 hours (1 hour in hot weather 90°F or above).

These guidelines also apply to carry-out meals, restaurant leftovers, and home-packed meals to go.

If in doubt, throw it out.

If you aren't sure that food has been prepared, served, or stored safely, throw it out. You may not be able to make food safe if it has been handled in an unsafe manner. For example, a food that has been left at room temperature too long may contain a toxin produced by bacteria—one that can't be destroyed by cooking. So if meat, poultry, fish, shellfish, or eggs have been left out for more than 2 hours, or if the food has been kept in the refrigerator too long, don't taste it. Just throw it out. Even if it looks and smells fine, it may not be safe to eat. If you have doubt when you're shopping or eating out, choose something else. Also, ask your local or state health department or Cooperative Extension Service Office for further guidance.

Advice For Today

Build a healthy base by keeping food safe to eat:

- Clean. Wash hands and surfaces often.
- Separate. Separate raw, cooked, and ready-to-eat foods while storing and preparing.
- Cook. Cook foods to a safe temperature.
- Chill. Refrigerate perishable foods promptly.
- Check and follow the label.
- Serve safely.
- When in doubt, throw it out.

Choose Sensibly

Choose a diet that is low in saturated fat and cholesterol and moderate in total fat

Fats supply energy and essential fatty acids, and they help absorb the fat-soluble vitamins A, D, E, and K. You need some fat in the food you eat, but choose sensibly. Some kinds of fat, especially saturated fats, increase the risk for coronary heart disease by raising the blood cholesterol (see box 15). In contrast, unsaturated fats (found mainly in vegetable oils) do not increase blood cholesterol. Fat intake in the United States is lower than it was many years ago, but most people still eat too much saturated fat. Eating lots of fat of any type can provide excess calories.

Box 15: Know The Different Types Of Fats

Saturated Fats

Foods high in saturated fats tend to raise blood cholesterol. These foods include high-fat dairy products (like cheese, whole milk, cream, butter, and full-fat ice cream), fatty fresh and processed meats, the skin and fat of poultry, lard, palm oil, and coconut oil. Keep your intake of these foods low.

Dietary Cholesterol

Foods that are high in cholesterol also tend to raise blood cholesterol. These foods include liver and other organ meats, egg yolks, and dairy fats.

Trans Fatty Acids

Foods high in *trans* fatty acids tend to raise blood cholesterol. These foods include those high in partially hydrogenated vegetable oils, such as many hard margarines and shortenings. Foods with high amounts of these ingredients include some commercially fried foods and some bakery goods.

Unsaturated Fats

All kinds of unsaturated fats (oils) help keep blood cholesterol low. Unsaturated fats occur in vegetable oils, most nuts, olives, avocados, and fatty fish like salmon. Unsaturated oils include both *monounsaturated fats* and *polyunsaturated fats*. Olive, canola, and peanut oils are some of the oils high in monounsaturated fats. Vegetable oils such as soybean oil, corn oil, and cottonseed oil and many kinds of nuts are good sources of polyunsaturated fats. Fatty ocean fish have a special type of polyunsaturated fat (omega-3 fatty acids) that may protect you against heart disease. Use moderate amounts of foods high in unsaturated fats, taking care to avoid excess calories.

Choose foods low in saturated fat and cholesterol

See box 16 for tips on limiting the amount of saturated fat and cholesterol you get from your food. Taking these steps can go a long way in helping to keep your blood cholesterol level low.

Box 16: Food Choices Low In Saturated Fat And Cholesterol And Moderate In Total Fat

Get most of your calories from plant foods (grains, fruits, vegetables). If you eat foods high in saturated fat for a special occasion, return to foods that are low in saturated fat the next day.

Fats and Oils

- Choose vegetable oils rather than solid fats (meat and dairy fats, shortening).
- If you need fewer calories, decrease the amount of fat you use in cooking and at the table.

Meat, Poultry, Fish, Shellfish, Eggs, Beans, and Nuts

- Choose 2 to 3 servings of fish, shellfish, lean poultry, other lean meats, beans, or nuts daily. Trim fat from meat and take skin off poultry—this removes about half the fat. Choose dried beans, peas, or lentils often.
- Limit your intake of high-fat processed meats such as sausages, salami, bologna, and other cold cuts. Try the lower fat varieties (check the Nutrition Facts Label).
- Limit your intake of liver and other organ meats. Use egg yolks and whole eggs in moderation. Use egg whites and egg substitutes freely when cooking since they contain no cholesterol.

Dairy Products

- Choose fat-free or low-fat milk, fat-free or low-fat yogurt, and low-fat cheese most often. Try switching from whole to fat-free or low-fat milk. This decreases the saturated fat and calories but keeps all other nutrients the same.

Prepared Foods

- Check the Nutrition Facts Label to see how much saturated fat and cholesterol are in a serving of prepared food. Choose foods lower in saturated fat and cholesterol.

Foods at Restaurants or Other Eating Establishments

- Try to order fish or lean meats as suggested above. Try to avoid or limit ground meat and fatty processed meats, marbled steaks, and cheese.
- Avoid foods with creamy sauces, and add little or no butter to your food.
- Choose fruit desserts most often.

Following the tips in the box above will help you keep your intake of saturated fat at less than 10 percent of calories and your cholesterol intake less than 300 mg/day. If you want more flexibility, see box 17 to find out your saturated fat limit in grams. The maximum number of saturated fat grams depends on the amount of calories you get daily. Use Nutrition Facts Labels to find out how much saturated fat is in prepared foods. If you choose one food that is high in saturated fat, make your other choices low in saturated fat. This will help you stay under your saturated fat limit for the day.

Box 17: What Is Your Upper Limit On Fat For The Calories You Consume?

Total Calories per Day	Saturated Fat in Grams	Total Fat in Grams
1,600	18 or less	53
2,200	24 or less	73
2,800	31 or less	93

Different forms of the same food may be very different in their content of saturated fat. Box 18 provides some examples. Try to choose the forms of food that are lower in saturated fat most often.

Box 18: A Comparison Of Saturated Fat In Some Foods

Food	Portion	Saturated Fat Content in Grams
Cheese	1 oz	6
Reduced fat cheese*	1 oz	3
Regular hamburger	3 oz cooked	8
Extra lean hamburger*	3 oz cooked	6
Whole milk	1 cup	5
Low-fat (1%) milk*	1 cup	1.5
Croissant	1 medium	7
Bagel*	1 medium	0
Ice cream	1/2 cup	4.5
Frozen yogurt*	1/2 cup	2

* Choice that is lower in saturated fat

NOTE: The foods listed are among the major food sources of saturated fat for U.S. adults and children.

Keep fat intake moderate

Aim for a total fat intake of no more than 30 percent of calories. If you need to reduce your fat intake to achieve this level, do so primarily by cutting back on saturated and *trans* fats. Check box 17 to find out how many grams of fat you can have for the number of calories you need. For example, at 2,200 calories per day, your suggested upper limit on fat intake would be about 73 grams. If you are at a healthy weight and you eat little saturated fat, you'll have leeway to eat some plant foods that are high in unsaturated fats. To see if you need to lose weight, see the guideline "Aim for a Healthy Weight," page 1.

Advice for children

Advice in the previous sections applies to children who are 2 years of age or older. It does not apply to infants and toddlers below the age of 2 years. Beginning at age 2, children should get most of their calories from grain products; fruits; vegetables; low-fat dairy products; and beans, lean meat and poultry, fish, or nuts.

Advice For Today

To reduce your intake of saturated fat and cholesterol,

- Limit use of animal fats, hard margarines (unless labeled *trans* fatty acid free), and partially hydrogenated shortenings. Use vegetable oils as a substitute.
- Choose fat-free or low-fat dairy products, cooked dried beans and peas, fish, and lean meats and poultry.
- Eat plenty of grain products, vegetables, and fruits daily.
- Use the Nutrition Facts Label to help you choose foods lower in fat, saturated fat, and cholesterol.

Choose Sensibly

Choose beverages and foods that limit your intake of sugars

Foods containing sugars and starches can promote tooth decay, especially if they stay in contact with your teeth for a long time. Eating or drinking sweet or starchy foods between meals is more likely to harm teeth than eating the same foods at meals and then brushing. Follow the tips in box 19 for healthy teeth.

Box 19: For Healthy Teeth And Gums

- Between meals, eat few foods or beverages containing sugars or starches. If you do eat them, rinse your mouth afterward to reduce risk of tooth decay.
- Rinse your mouth after eating dried fruit.
- Brush and floss teeth regularly. Use fluoride toothpaste.
- Ask your dentist or health care professional about the need for supplemental fluoride, especially for children and if the water you drink is not fluoridated.

Intake of sugars is increasing

Since the early 1990s, Americans have increased their calorie intake. This increase has come largely from an increased intake of carbohydrates, mainly in the form of added sugars. Added sugars are sugars and syrups added to foods in processing or preparation, not the naturally occurring sugars in foods like fruit or milk. In the United States, the number one source of added sugars is nondiet soft drinks (soda or pop). Sweets and candies, cakes and cookies, and fruit drinks and fruitades are also major sources of added sugars. Intake of a lot of foods high in added sugars, like soft drinks, is of concern because children, adolescents, and women who consume these foods consume less of more nutritious foods like milk.

Some foods, like chocolate milk, presweetened cereals, and sweetened canned fruits are high in vitamins and minerals as well as in added sugars. These foods provide extra calories along with the nutrients. These foods are fine if you need the extra calories. However, if you eat lots of beverages and foods high in sugars, you may get less of the nutrients you need for good health. So choose sensibly to limit your intake of sugars. And brush your teeth or rinse your mouth with water after eating foods that contain sugars.

Use box 20 to identify the most commonly eaten foods that are high in added sugars (unless they are labeled "sugar free" or "diet"). Limit your use of these beverages and foods. Drink water to quench your thirst, and offer it to children.

Box 20: Major Sources* Of Added Sugars In The United States

- Soft drinks
- Candy
- Cakes, cookies, pies
- Fruitades and drinks such as fruit punch and lemonade
- Dairy desserts such as ice cream

* All kinds, except diet or sugar-free

The Nutrition Facts Label gives the content of *total* sugars (naturally occurring sugars plus added sugars, if any—see figure 3). So you need to look at the ingredient list to find out if sugars have been added. There are many names for sugars (see box 21).

Box 21: Names For Added Sugars That Appear On Food Labels

A food is likely to be high in sugars if one of these names appears first or second in the ingredient list, or if several names are listed.

Brown sugar	Invert sugar
Corn sweetener	Lactose
Corn syrup	Maltose
Dextrose	Malt syrup
Fructose	Molasses
Fruit juice concentrate	Raw sugar
Glucose	Sucrose
High-fructose corn syrup	Syrup
Honey	Table sugar

Sugar substitutes

Sugar substitutes such as saccharin, aspartame, acesulfame potassium, and sucralose are extremely low in calories. Some people find them useful if they want a sweet taste without the calories. Some foods that contain sugar substitutes, however, still have calories. Unless you reduce the total calories you eat or increase your physical activity, using sugar substitutes will not cause you to lose weight.

Sugars and other health problems

Behavior. Intake of sugars does not appear to affect children's behavior patterns or their ability to learn. Many scientific studies conclude that sugars do not cause hyperactivity in children.

Weight control. Children and adults have increased the amount of sugars they consume. This has contributed to higher caloric intakes. Foods that are high in sugars are often high in calories but low in essential nutrients. When you take in extra calories and don't offset them by increasing your physical activity, you will gain weight. As you aim for a healthy weight and fitness, keep an eye on serving size for all foods and beverages, not only those high in sugars. See box 8 for recommended serving sizes.

Advice For Today

- Choose sensibly to limit your intake of beverages and foods that are high in sugars.
- Remember the simple tips to keep your teeth and gums healthy.
- Get most of your calories from grains (especially whole grains), fruits and vegetables, low-fat or non-fat dairy products, and lean meats or meat substitutes.
- Drink water often.
- Take care not to let soft drinks or other sweets crowd out other foods you need to maintain health, such as low-fat milk or other good sources of calcium.

Choose Sensibly

Choose and prepare foods with less salt

You can reduce your chances of developing high blood pressure by consuming less salt. You also can take several other steps to help keep your blood pressure in the healthy range (see box 22). In the body, sodium—which you get mainly from salt—plays an essential role in regulating fluids and blood pressure. Many studies in diverse populations have shown that a high sodium intake is associated with higher blood pressure.

Box 22: Steps That May Help Keep Blood Pressure In A Healthy Range

- Choose and prepare foods with less salt.
- Aim for a healthy weight: Blood pressure increases with increases in body weight and decreases when excess weight is reduced.
- Increase physical activity: it helps lower blood pressure, reduce risk of other chronic diseases, and manage weight.
- Eat fruits and vegetables. They are naturally low in salt and calories. They are also rich in potassium (see box 12), which may help decrease blood pressure.
- If you drink alcoholic beverages, do so in moderation. Excessive alcohol consumption has been associated with high blood pressure.

There is no way to tell who might develop high blood pressure from eating too much salt. However, consuming less salt or sodium is not harmful and can be recommended for the healthy, normal person (see box 23).

At present, the firmest link between salt intake and health relates to blood pressure. High salt intake also increases the amount of calcium excreted in the urine. Eating less salt may decrease the loss of calcium from bone. Loss of too much calcium from bone increases the risk of osteoporosis and fractures.

Box 23: Is Lowering Salt Intake Safe?

- Eating too little salt is not generally a concern for healthy people. If you are being treated for a chronic health problem, ask your doctor about whether it is safe for you to reduce your salt intake.
- As a public health measure, some table salt is fortified with iodine. If you use table salt to meet your need for iodine, a small amount—about 1/4 teaspoon of iodized salt—provides more than half the daily iodine requirement.
- Your body can adjust to prevent too much salt loss when you exercise heavily or when it is very hot. However, if you plan to reduce your salt intake and you exercise vigorously, it is sensible to decrease gradually the amount of salt you consume.

Salt is found mainly in processed and prepared foods

Salt (sodium chloride) is the main source of sodium in foods (box 24). Only small amounts of salt occur naturally in foods. Most of the salt you eat comes from foods that have salt added during food processing or during preparation in a restaurant or at home. Some recipes include table salt or a salty broth or sauce, and some cooking styles call for adding a very salty seasoning such as soy sauce. Not all foods with added salt taste salty. Some people add salt or a salty seasoning to their food at the table. Your preference for salt may weaken if you gradually add smaller amounts of salt or salty seasonings to your food.

Box 24: Salt Versus Sodium

- Salt contains sodium. Sodium is a substance that affects blood pressure.
- The best way to cut back on sodium is to cut back on salt and salty foods and seasonings.
- When reading a Nutrition Facts Label, look for the sodium content (see box 8). Foods that are low in sodium (less than 5% of the Daily Value or DV) are low in salt.

Aim for a moderate sodium intake

Most people consume too much salt, so moderate your salt intake. Healthy children and adults need to consume only small amounts of salt to meet their sodium needs—less than 1/4 teaspoon of salt daily. The Nutrition Facts Label lists a Daily Value of 2,400 mg of sodium per day (see figure 3). This is the amount of sodium in about 1 teaspoon of salt. See box 25 for helpful hints on how to keep your sodium intake moderate.

Box 25: Ways To Decrease Your Salt Intake

At the Store

- Choose fresh, plain frozen, or canned vegetables without added salt most often—they’re low in salt.
- Choose fresh or frozen fish, shellfish, poultry, and meat most often. They are lower in salt than most canned and processed forms.
- Read the Nutrition Facts Label (see figure 3) to compare the amount of sodium in processed foods—such as frozen dinners, packaged mixes, cereals, cheese, breads, soups, salad dressings, and sauces. The amount in different types and brands often varies widely.
- Look for labels that say “low-sodium.” They contain 140 mg (about 5% of the Daily Value) or less of sodium per serving.
- Ask your grocer or supermarket to offer more low-sodium foods.

Cooking and Eating at Home

- If you salt foods in cooking or at the table, add small amounts. Learn to use spices and herbs, rather than salt, to enhance the flavor of food.
- Go easy on condiments such as soy sauce, ketchup, mustard, pickles, and olives—they can add a lot of salt to your food.
- Leave the salt shaker in a cupboard.

Eating Out

- Choose plain foods like grilled or roasted entrees, baked potatoes, and salad with oil and vinegar. Batter-fried foods tend to be high in salt, as do combination dishes like stews or pasta with sauce.
- Ask to have no salt added when the food is prepared.

Any Time

- Choose fruits and vegetables often.
- Drink water freely. It is usually very low in sodium. Check the label on bottled water for sodium content.

Advice For Today

Choose sensibly to moderate your salt intake. Choose fruits and vegetables often. They contain very little salt unless it is added in processing. Read the Nutrition Facts Label to compare and help identify foods lower in sodium—especially prepared foods. Use herbs, spices, and fruits to flavor food, and cut the amount of salty seasonings by half. If you eat restaurant foods or fast foods, choose those that are prepared with only moderate amounts of salt or salty flavorings.

Choose Sensibly

If you drink alcoholic beverages, do so in moderation

Alcoholic beverages are harmful when consumed in excess. Excess alcohol alters judgment and can lead to dependency and a great many other serious health problems. Taking more than one drink/day for women or two drinks/day for men (see box 26) can raise the risk for auto accidents, other accidents, high blood pressure, stroke, violence, suicide, birth defects, and certain cancers. Even one drink/day can slightly raise the risk of breast cancer. Too much alcohol may cause social and psychological problems, cirrhosis of the liver, inflammation of the pancreas, and damage to the brain and heart. Heavy drinkers also are at risk of malnutrition because alcohol contains calories that may substitute for those in nutritious foods. If adults choose to drink alcoholic beverages, they should consume them only in moderation (box 26)—and with meals to slow alcohol absorption.

Box 26: What Is Drinking In Moderation?

Moderation is defined as no more than one drink per day for women and no more than two drinks per day for men. This limit is based on differences between the sexes in both weight and metabolism.

Count as a drink—

12 ounces of regular beer (150 calories)

5 ounces of wine (100 calories)

1.5 ounces of 80-proof distilled spirits (100 calories)

Note that even moderate drinking provides extra calories.

Drinking in moderation may lower risk for coronary heart disease, mainly among men over age 45 and women over age 55. Moderate consumption provides little, if any, health benefit for younger people. Risk of alcohol abuse increases when drinking starts at an early age.

Who should not drink?

Some people should not drink alcoholic beverages at all. These include

- *Children and adolescents*
- *Individuals of any age who cannot restrict their drinking to moderate levels.* This is a special concern for recovering alcoholics, problem drinkers, and people whose family members have alcohol problems.
- *Women who may become pregnant or who are pregnant.* A safe level of alcohol intake has not been established for women at any time during pregnancy, including the first few weeks. Major birth defects, including fetal alcohol syndrome, can be caused by heavy drinking by the pregnant mother. Other fetal alcohol effects may occur at lower levels.

- *Individuals who plan to drive, operate machinery, or take part in other activities that require attention or skill.* Most people retain some alcohol in the blood up to 2 to 3 hours after a single drink.

- *Individuals taking certain prescription or over-the-counter medications that can interact with alcohol.* If you take medications, ask your health care professional for advice about alcohol intake, especially if you are an older adult.

Advice For Today

If you choose to drink alcoholic beverages, do so sensibly. Limit intake to one drink/day for women or two/day for men, and take with meals to slow alcohol absorption. Avoid drinking before or when driving, or whenever it puts you or others at risk.

Discussion Of Proposed Changes

In its discussions, the Dietary Guidelines Advisory Committee determined that research conducted since 1995 supports much of the text of the fourth edition of the *Dietary Guidelines*. This section of the report identifies the committee's recommendations for changes to the fourth edition and provides the basis for these recommendations. It covers overall recommendations—ones that apply to the document as a whole—and recommendations specific to each guideline.

General

Three Major Messages

The committee recommends a major revision of the presentation of the guidelines by introducing three basic messages: Aim for fitness, Build a healthy base, and Choose sensibly—for good health. The intent of these messages is to help the user to organize the guidelines in a memorable, meaningful way (the ABCs for good health).

Order of the Guidelines

The use of the three messages calls for a somewhat revised order of the guidelines, with the weight and physical activity guidelines preceding the others. The committee considers this change essential for clarity.

Writing Style

Since focus group participants have indicated that they like the "Advice for today" style (Prospect Associates, 1995), much of the text has been changed to be more targeted and actionable. Also in response to comments from focus group participants, the number of boxes has been increased—from 16 to 26.

Introduction

The brief text in the introduction now focuses on the three basic messages. It continues to provide an overview of the purposes of the booklet, using a positive approach.

The committee suggests deleting content on food composition, the basis of body weight, and Recommended Dietary Allowances. Pertinent content on food composition or body weight is moved to specific guidelines. With the ongoing work on Dietary Reference Intakes, Recommended Dietary Allowances are in a state of flux and have been omitted entirely.

Aim for a Healthy Weight

Guideline

The proposed title and general focus of this guideline basically are unchanged from the 1995 version in its message to "maintain or improve your weight." There is now general agreement about the health risks of obesity, since the data linking overweight/obesity to adverse health outcomes are incontrovertible. Justification for this position is provided in a recent report from the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK, in press).

There is less agreement about the management of obesity—especially with regard to whether the emphasis should be on weight maintenance or on weight loss. Because of concern that repeated failures at weight loss may be harmful and might outweigh the risks of maintaining the overweight or obese state, an NIDDK task force (NIDDK, 1994) conducted a comprehensive review of the literature on the potential negative physical consequences of weight cycling in obese subjects. The evidence was not sufficiently compelling to override the potential benefits of moderate weight loss in significantly obese persons. Furthermore, studies by Bartlett et al. (1996) and Foster et al. (1996) of groups of individuals who had experienced at least one bout of significant weight loss and weight regain found that weight cycling is not associated with long-term adverse psychopathology such as depression. Therefore, the committee considers the revised title to be appropriate for all people.

As in the 1995 Guidelines, the message to persons with a healthy weight is to aim to prevent weight gain, even within the "healthy" body mass index (BMI) range. The message for persons with overweight or obesity is, initially, to maintain current weight and then to aim to lose about 10 percent of body weight. This is consistent with National Institute of Health (NIH, 1998) guidelines and the recently expressed views of Willett and colleagues (1999). This position is also consistent with a recent NIDDK Obesity Task Force Report, which stated the following:

Efforts to prevent further weight gain in adults at risk for overweight and obesity are essential. The advice to eat a healthful diet, increase physical activity, and avoid further weight gain is appropriate for almost all individuals at or above a healthy weight. For those whose current or future health is at risk because of their obesity and who are motivated to make lifestyle changes, a recommendation for weight loss is appropriate (NIDDK, in press).

In part because of the importance of physical activity in the etiology and management of obesity and other disorders, the committee recommends deferring most of the discussion of physical activity to a new, separate guideline (see next section).

The proposed change in the guideline title improves clarity. The word *balance* in the 1995 guideline “Balance the food you eat with physical activity” was interpreted by some to suggest that it was okay to be overweight as long as activity and intake were balanced. The word *improve* in the phrase “Maintain or improve your weight” was interpreted by some to mean to increase weight and by others to mean to decrease weight (Prospect Associates, 1998). The proposed title simplifies the message in one actionable phrase, “Aim for a healthy weight.”

Introductory Paragraph

The introduction, as in the previous version, emphasizes the relationship of overweight and obesity with risk for various diseases, and it adds risk for premature mortality (Calle et al., 1999).

Evaluate Your Body Weight

The committee recommends that this section replace the 1995 sections “How to evaluate your body weight” and “Location of body fat” because of the complementary contributions to health of body weight and body fat location. It suggests that the section be directed toward adults specifically. The revised text is tailored to the content of boxes 1 and 2 and figure 1 (see below).

Some individuals with a BMI below 25 kg/m² may have increased medical risk, especially if they have an increased waist circumference, which is an additional independent predictor of risk factors and morbidity (Han, 1995; Lemieux et al., 1996; Rexrode, 1998). Waist circumference has been found to be a better marker of abdominal fat content than the ratio of waist-to-hip circumferences (Despres, 1989) and to have greater prognostic significance for disease risk (NIH, 1998). Relatively accurate measurements of abdominal fat can be made with computed tomography or magnetic resonance imaging. However, these methods are expensive and not readily available in clinical practice. Hence, the committee recommends the use of waist circumference alone, not in comparison with hip circumference, as the most practical measurement of a person’s abdominal fat content. At BMIs above 35 kg/m², waist circumference has little added predictive power of disease risk (NIH, 1998). It is, therefore, not necessary to measure waist circumference in persons with BMIs at or above 35 kg/m². In contrast to the absence of gender differences for BMI, waist circumference cut-offs differ for men and women.

Not all persons who have a BMI in the overweight category need to lose weight for health reasons. However, if the BMI is ≥ 25 kg/m² or if the waist circumference is >88 cm (35 in) for women or >102 cm (40 in) for men, the presence of additional risk factors for obesity-related conditions should be assessed. Weight reduction may be indicated, especially if a person has two or more obesity-related risk factors (NIH, 1998). Obese individuals with a

BMI ≥ 30 kg/m² are likely to have health benefits from weight reduction (Maggio and Pi-Sunyer, 1997).

Manage Your Weight

In the proposed revision of this section, the first paragraph introduces the concept of the relative contributions to weight gain of modifiable attributes (i.e., individual food and physical activity choices) versus unmodifiable and less modifiable attributes (i.e., genes and environment). Specifically, the committee recommends the addition of a paragraph that makes it clear that genetic traits and the environment greatly influence but do not determine an individual’s weight status. The committee acknowledges that the three major factors that modulate body weight (metabolism, physical activity, and diet) are each influenced by genetic traits (Weinsier et al., 1998). However, the recent increase in obesity prevalence cannot be explained on the basis of genetic mutations within the general population. Despite major environmental obstacles of modern society, personal decisions regarding physical activity and dietary lifestyle can still affect an individual’s weight status (Weinsier, 1999).

The committee recommends that this section emphasize the importance of long-term weight control through a lifestyle that encompasses other components of the Dietary Guidelines. This emphasis is in concert with recently published documents on weight control published by the NIH (1998) and the World Health Organization (WHO, 1998).

The proposed second paragraph introduces a new emphasis on the consumption of foods that are low in energy density as a means to control energy intake. The statement is included “Eating mainly vegetables, fruits, and grains helps you feel full, achieve good health and manage your weight.” A series of recent studies indicates that the energy density of foods plays a role in short-term daily energy consumption (Bell et al., 1998; Rolls et al., 1998, 1999; Stubbs, Harbron et al., 1995; Stubbs, Ritz et al., 1995). In these tightly controlled metabolic ward studies, which ranged in duration from a few days to 2 weeks, subjects were given free access to meals of varying energy density, and in some instances similar fat content. The reports of Stubbs and colleagues indicated that energy density increased with the fat content of the meals. In turn, energy balance over periods of 7–14 days was greater with *ad libitum* intake of the high-fat, high-energy-dense meals than with the low-fat, low-energy-dense meals. The authors commented: “Of considerable interest is the apparent ease with which normal men can, without being aware of it, feed themselves into a large positive energy balance while consuming a high-fat diet” (Stubbs, Harbron et al., 1995).

A subsequent report of this group (Stubbs et al., 1996) demonstrated that the macronutrient content of the diet did not determine energy intake when the meals, fed over a 14-day period, were isoenergetic. The studies from the labora-

tories of Bell and of Rolls (cited above) showed that, regardless of the energy density of the meals, subjects consumed similar amounts of food by weight. However, in agreement with the findings of Stubbs and colleagues (1996), the subjects consumed significantly more energy with access to high energy-dense meals, whether high in fat or not. This excess in energy intake occurred despite satiety levels that were comparable among the diets. In an earlier study (Duncan et al., 1983), *ad libitum* access to foods low in energy density facilitated portion control and spontaneous energy intakes at levels significantly below those observed with free access to energy-dense meals. The study was conducted over two 5-day periods, on a clinical research center, among obese and lean women who were permitted unlimited intakes of meals of either high or low energy density. Importantly, comparable levels of satiety occurred with meals high or low in energy density, indicating that subjects ate to a comfortable level of fullness with both diets. Despite comparable feelings of fullness, total daily energy was almost one-half as much on the low energy-dense meals.

Thus, available data suggest that access to low energy-dense meals favors control of energy intake. Long-term studies are limited to those showing weight-control advantages of *ad libitum* intake of low-fat, high-carbohydrate meals, which may or may not have been low in energy density (Hammer et al., 1989; Shintani et al., 1991). The implication of the above studies is that energy intake is determined to a large extent by the weight of the meals consumed (Rolls and Hill, 1998). Hence, excessive energy intake is more likely to occur with energy-dense meals, particularly high-fat meals. As stated in the report:

Limiting fat intake and increasing carbohydrate and fiber intake during weight loss allows dieters to consume a greater and perhaps more satisfying volume of food and helps them avoid periods of positive energy balance, which lead to weight gain.

A diet of low energy density is usually characterized as low in fat and high in complex carbohydrates and fiber. Fruits, vegetables, and grain products are likely to be the mainstays of a diet with a low energy density. (Rolls and Hill, 1998, page 41)

These research findings are congruous with the other Dietary Guidelines for Americans proposed in this report, and the NIH (1998) and WHO (1998) reports, emphasizing relatively high-fiber, low-fat vegetables, fruits, and grains for the prevention of obesity.

The paragraph on physical activity includes a new recommendation to aim to be active for at least 45 minutes per day for weight maintenance (Leon et al., 1979; NIH, 1998; Pollock et al., 1998; Rippe and Hess, 1998; see also the next section "Be Physically Active Each Day").

The committee also suggests clarifying that low-fat foods are not necessarily low in calories (Rolls and Miller, 1997).

The paragraph on snacks and foods eaten away from home now includes a few concrete suggestions. The increased attention reflects changes in eating patterns in the United States (Lin et al., 1999).

The committee suggests adding a paragraph to address older adults, including an emphasis on weight-bearing exercise to maintain bone and muscle (Pollock and Evans, 1999).

If You Need to Lose Weight, Do So Gradually

The proposed guideline is congruous with the NHLBI Guidelines (NIH, 1998) in indicating that weight reductions of 5 percent to 15 percent may reduce risk factors for obesity-associated conditions (Goldstein, 1992) and that the initial goal should be to lose 10 percent of one's weight over about 6 months (NIH, 1998). The committee recommends a minor change in the specification of a gradual rate of weight loss: 1/2 to 2 lb/wk instead of 1/2 to 1 lb/wk. This higher upper limit is consistent with NIH Clinical Guidelines, and it does not significantly increase the risk of new gallstone formation (Weinsier et al., 1995).

Encourage Healthy Weight in Children

During the past decade, the number of U.S. children who are overweight has more than doubled. Approximately 11 percent of American children are overweight. An additional 14 percent have a BMI between the 85th and 95th percentiles, which puts them at increased risk for becoming overweight (Troiano and Flegal, 1998). New federal guidelines for healthy BMI levels for children are under development and will soon be available to health-care providers and the public. Parents with concerns about the weight of their children are referred to their health-care providers for evaluation and intervention, as appropriate.

The committee suggests continuing the recommendation to limit television watching since one quarter of all U.S. children watch four or more hours of television each day, and hours of television watched is positively associated with increased BMI and skinfold thickness (Andersen et al., 1998). The committee suggests drawing attention to the parents' role in setting examples for their children. Parents have a major impact on their children's eating and physical activity patterns. Nutrient intakes are known to aggregate in families, with the strongest associations found between mothers and their children (Oliveria et al., 1992). In addition, children's eating behaviors are influenced by characteristics within the family unit, such as the number of meals eaten together (Vauthier et al., 1996).

The committee also suggests giving more attention to child feeding practices. Young children are reported to adjust their meal size according to the energy density of

food available and are able to adjust their food intake across successive meals to regulate energy intake tightly for 24-hour periods (Birch et al., 1991). However, child-feeding practices have been shown to influence children's responsiveness to energy density and meal size (Birch and Fisher, 1998). When parents assume control of meal size or coerce children to eat rather than allowing them to focus on their internal cues of hunger, children's ability to regulate meal size in response to energy density is diminished (Johnson and Birch, 1994). This seems especially problematic among girls with high BMIs and may play a later role in the chronic dieting and dietary restraint that have become common among U.S. adolescent girls (Johnson and Birch, 1994). In summary, perhaps some of the best advice regarding child feeding practices continues to be the division of parental and child responsibility. That is, parents are responsible for presenting a variety of healthful foods to children and for the manner in which these foods are presented, but children are responsible for whether and how much they eat (Satter, 1986).

Serious Eating Disorders

The committee suggests revising the heading and content of the 1995 section entitled "Problems with excessive thinness." The committee recommends deletion of the sentence: "Excessive concern about weight may cause or lead to such unhealthy behaviors as excessive exercise, self-induced vomiting or the abuse of laxatives or other medications." That sentence might be misinterpreted to suggest that serious attempts at weight control might lead to eating disorders. Most studies of behavioral weight loss interventions report improvements in psychological status during weight loss. (Wadden et al., 1997; Wing et al., 1984). The committee recommends adding guidance to seek the help of a health professional if there are signs of an eating disorder.

Advice for Today

The text is changed to place more emphasis on foods from the grains, fruit, and vegetable groups. It places less emphasis on physical activity in this section only because of the addition of a separate physical activity guideline.

Figure 1: Are You at a Healthy Weight?

The committee suggests that the previous graphic entitled "Are you overweight?" be retained with the title "Are you at a healthy weight?" It recommends that the figure include BMI cut-points because of the increasing use of BMI as a reference guide for a healthy body weight. A healthy body weight has recently been defined as a BMI of 18.5 to 24.9 kg/m², overweight as a BMI of 25 to 29.9 kg/m², and obesity as a BMI of 30 kg/m² (NIH, 1998; WHO, 1998). The relevance of these cut-offs to health risk and mortality is discussed in a cogent review article by Willett et al. (1999). Accordingly, the cut-points between the colors in the figure

should occur at BMIs of 18.5, 25, and 30, to coincide with the cut-points recommended in the NHLBI and WHO reports. As was the case in the 1995 version of the guidelines, BMI cut-offs are the same for men and women (Gallagher et al., 1996) since morbidity appears to increase with increasing BMI in a similar manner for men and for women (Willett et al., 1999), as does mortality (Stevens et al., 1998).

Box 1: Evaluate Your Weight (Adults)

Box 2: Find Out Your Other Risk Factors

The committee recommends adding these boxes to provide consumers with a step-by-step method that is consistent with NHLBI (NIH, 1998) recommendations.

Box 3: Choose Sensible Portion Sizes

The committee recommends that this box, which focuses on portion size, replace box 6, "To Decrease Calorie Intake." The points made in former box 6 are now made in numerous places throughout the booklet.

Be Physically Active Each Day

Recommendation for a New Guideline

The committee recommends the addition of a separate guideline on physical activity for several reasons, as summarized here and discussed in more detail below:

- Relationships between nutrition and physical activity are multi-faceted, including, but going beyond weight management.
- The health benefits of physical activity are extensive and are intertwined with the health benefits of healthful eating patterns.
- Physical activity levels in the United States are much lower, on average, than is desirable for good health and for weight management.
- People in every age group need to improve their physical activity levels, regardless of their weight status.

In the 1995 Dietary Guidelines, physical activity recommendations were included with the guideline "Balance the food you eat with physical activity—maintain or improve your weight." Based on current consensus documents (CDC, 1997a; Mazzeo, et al., 1998; NIH, 1998; NIH Consensus Development Panel on Physical Activity and Cardiovascular Health; Pate, et al., 1995; Pollock and Evans, 1999; Pollock et al., 1998; U.S. DHHS, 1996, 1998) regarding the four points mentioned above, the committee recommends separation of most of the content on physical activity from the weight guideline and the addition of content to form a physical activity guideline.

In addition, the committee recommends a separate physical activity guideline to provide a clearer, more understandable, and more forceful message to consumers. A recent survey commissioned jointly by the American College of Sports Medicine, The American Dietetic Association, and the International Food Information Council (ACSM, et al., 1999) showed that sports and nutrition professionals support collaborative efforts to promote physical activity and nutrition advice for consumers.

Below, the committee discusses a definition of physical activity, interactions between nutrition and physical activity, health benefits and nutrition interactions, current physical activity levels and improvements needed, and the rationale for specific recommendations.

Definition. Physical activity is generally defined as bodily movement involving muscle contraction and resulting in energy expenditure above the basal rate (U.S. DHHS, 1996). Aerobic moderate-intensity physical activity expends 3 to 6 metabolic equivalents (METs), which is equivalent to walking at a pace of 3 to 4 miles per hour for 30 minutes (i.e., 2 miles briskly) (Pate et al., 1995). Aerobic vigorous activity (60 to 90 percent of maximum heart rate or 50 to 85 percent of maximal aerobic capacity) is related to cardiovascular fitness. Resistance training builds strength and flexibility. Moderate, vigorous, and strength activities affect general physical fitness; vigorous activity benefits cardiovascular fitness specifically. Physical fitness is a general marker of physical activity and is seen as the ability to carry out daily tasks easily and with vigor (U.S. DHHS, 1996).

Relationships Between Nutrition and Physical Activity. Relationships between nutrition and physical activity are multi-faceted and include the potential to become obese, the intake of essential nutrients, and weight management.

The prevalence of overweight among U.S. adults and children is rising (U.S. DHHS, 1998). The etiology of the rising prevalence of obesity is unclear, although there is increasing epidemiologic evidence to suggest that physical inactivity may play a major role (Weinsier et al., 1998). Physical activity offers an avenue for energy expenditure, which can aid in weight management. In fact, based on cross-sectional and prospective epidemiological studies, several investigators have suggested that physical activity may have a stronger influence on variations in adiposity than do dietary intake patterns (Poehlman et al., 1995; Rissanen et al., 1991; Samaras et al., 1999). However, because both self-reported dietary and physical activity data are subject to bias (Prentice, et al., 1986), these findings should be viewed with caution (DiPietro, 1995). Nonetheless, the consistency of the epidemiologic data on obesity and physical activity supports the association.

Some data show a relationship between physical activity and the development of obesity in children. Klesges and colleagues (1995) followed 146 healthy children, with an

oversampling of obese children ages 3–5 years, for 2 years. Obesity in this study was defined as greater than the 75th percentile of BMI according to the U.S. Department of Health and Human Services (U.S. DHHS, 1987) norms. The major modifiable physical activity predictors of change in BMI included baseline aerobic activity and change in activity between the second and third year of the study. Notably, in this study, 55 percent of the children had at least one overweight parent. Moore and colleagues (1995) found that more active preschoolers (ages 3–5 years) were likely to gain less weight than less active preschoolers over the course of 1 to 3 years. Upon follow-up in the Cardiovascular Risk in Young Finns Study (Raitakari et al., 1994), physically active young women and men had smaller subscapular skinfolds, indicating less body fat, than did the inactive youth and young adults. Regarding weight control, a number of randomized, controlled experimental studies reported in *Guidelines for School and Community Programs to Promote Lifelong Physical Activity among Young People* (CDC, 1997a) showed that the degree of overweight among obese children decreased with physical activity.

Higher energy expenditure through physical activity allows for higher intakes of energy and thus facilitates intake of recommended amounts of nutrients without weight gain. Thirty minutes of moderate-intensity activity burns approximately 150 to 200 kilocalories for an adult, depending on body size (Ainsworth, et al., 1993; Pate et al., 1995), and can be balanced by correspondingly increased energy intakes. van der Wielen and colleagues (1996) reported follow-up data from the Study in Europe on Nutrition and the Elderly, a Concerted Action Study, that nutrient intake was greater among physically active than inactive older Dutch persons. On a cautionary note, riboflavin requirements may increase upon vigorous physical activity (Belko et al., 1983; Soares et al., 1993; Winters et al., 1992). However, the increased need for riboflavin may be offset by increased intake (van der Wielen, et al., 1996).

Blair and colleagues (1996) reviewed epidemiologic, animal, clinical, and metabolic research and concluded that diet and physical activity together have the potential to reduce the risk of chronic diseases such as type 2 diabetes mellitus, heart disease, obesity, and osteoporosis.

Physical activity also facilitates weight management. Because of the energy expended by physical activity, persons who are underweight or at a healthy body weight will need to ensure adequate food consumption to gain or maintain weight, respectively, if they increase their level of physical activity.

In view of these data, the committee finds that the substantial weight of the evidence supports a synergistic relationship between physical activity and diet.

Health Benefits. The health benefits of physical activity extend well beyond energy balance and weight management—the only two benefits identified in the 1995 Dietary

Guidelines. Within the past 5 years, nine national position papers or reports have been published documenting the importance of moderate physical activity for health and well-being (CDC, 1997a; Mazzeo, et al., 1998; NIH, 1998; NIH Consensus Development Panel on Physical Activity and Cardiovascular Health; Pate, et al., 1995; Pollock and Evans, 1999; Pollock et al., 1998; U.S. DHHS, 1996, 1998). The most striking evidence supporting the general health benefits of moderate physical activity come from the *Surgeon General's Report: Physical Activity and Health* (U.S. DHHS, 1996), draft guidelines of *Healthy People 2010* (U.S. DHHS, 1998), and recommendations from the Centers for Disease Control and Prevention (CDC) (Pate, 1995). Those reports document that being moderately physically active for 30 to 45 minutes daily increases general physical fitness; and it reduces the risk of developing heart disease, hypertension, colon cancer, and type 2 diabetes mellitus—conditions that are major contributors to morbidity and mortality in the United States. All-cause mortality is lower among persons who are physically active than those who are sedentary, but the effect is stronger for cardiovascular fitness than for general fitness. Among hypertensive adults, physical activity reduces systolic and diastolic blood pressure. Further, physical activity is related to improvements in flexibility, bone mass density, risk of hip fractures in women, depression and anxiety, and health-related quality of life.

With osteoporosis being a leading cause of fractures in older persons, building and maintaining bone density is critical. Engaging in physical activity has a positive effect on bone health among people of all ages (Layne and Nelson, 1999; Mazzeo et al., 1998; Riddoch, 1998; U.S. DHHS, 1996). Conversely, bed rest or lack of exercise can result in bone loss (Convertino et al., 1997). In young persons, bone mineral density is higher among athletes than among non-athletes (Riddoch, 1998; U.S. DHHS, 1996). Similarly, bone mineral density is higher in older persons who exercise than those who do not (Mazzeo et al., 1998). Resistance training has a greater effect than aerobic activity, although either confer benefit as long as they are weight-bearing in nature (Layne and Nelson, 1999).

In children, research shows that physical activity improves aerobic endurance (cardiovascular fitness) and muscular strength, and may improve BMI, blood lipids, blood pressure (CDC, 1997a), and bone health (Ulrich, 1996). Among children with borderline hypertension, physical activity decreases blood pressure (CDC, 1997a). Among teenagers, physical activity is associated with greater self-esteem and self-concept, and lower levels of anxiety and stress (CDC, 1997a).

Strength and flexibility confer general health benefits in addition to those of aerobic physical fitness. Resistance training may increase muscle strength and physical function (Pollock and Evans, 1999), which, in turn, make it easier to engage in free-living physical activity. Specifically,

compared with aerobic training, resistance training results in greater muscle fiber hypertrophy (Goreham et al., 1999), greater muscle mass (Ades et al., 1996; Hunter et al., 1998; Pollock and Evans, 1999), and greater muscle strength in almost every age/gender group (Geliebter et al., 1997; Hunter et al., 1995; Kraemer et al., 1997; Marks et al., 1995; Pollock and Evans, 1999; Treuth et al., 1998). With increased postural stability and flexibility, the elderly may experience fewer falls (Mazzeo et al., 1998). The observed benefit of increased physical fitness is increased physiologic ease of conducting daily activities, such as standing from a chair, carrying a load of groceries, and increasing the velocity and endurance of walking (Ades et al., 1996; Hunter et al., 1995). These functional improvements appear *not* to be explained by greater peak aerobic capacity, but by increased strength (Ades et al., 1996; Parker et al., 1996).

The benefits of moderate physical activity in the whole population are greater than the hazards, although injury can occur (U.S. DHHS, 1996). The types of injury include musculoskeletal injuries, metabolic abnormalities (e.g., dehydration upon extreme exertion), hematologic and body organ injuries (e.g., anemia or bladder trauma from long-distance running), trauma (e.g., injury resulting from collisions with motorized vehicles), infectious and inflammatory conditions (e.g., swimmer's ear), and cardiac events (sudden death upon vigorous exertion). Foot and leg injuries are common among runners (U.S. DHHS, 1996). A number of adverse events are related to high levels of intensity, duration, or frequency and can be decreased to some extent by exercising within known limits, training properly, and starting exercise programs slowly if one is usually inactive. Sudden death upon vigorous activity, which has received recent attention, is less common among physically active persons than sedentary persons. Persons with known cardiovascular disease, those who are at high risk of heart disease, and men over age 40 and women over age 50 who are considering beginning an activity program should consult their physician before starting. (U.S. DHHS, 1996).

Low Physical Activity Levels Among Americans. Several reports describe the considerable lack of physical activity by Americans. Sixty percent of Americans are not active on a regular basis and 23 percent of adults are sedentary (U.S. DHHS, 1996, 1999). Twenty-two percent of U.S. adults reported being moderately physically active in 1985, and there was only one percentage point increase over a decade—to 23 percent in 1995 (U.S. DHHS, 1999). Similarly, the decrease in sedentary lifestyle was only one percentage point, from 24 percent of adults in 1985 to 23 percent in 1995 (U.S. DHHS, 1999). Among men and women over the age of 70, 14.3 percent and 9.8 percent, respectively, reported exercising vigorously 2 to 4 days per week, both of which are the lowest percentages among age groups (by decade) from 20 to 70 and over (USDA, 1998a).

For youth, the data show low activity levels as well. In 1997, only 21 percent of youth in grades 9 through 12 were

physically active for at least 30 minutes for five of the seven previous days, and only 27 percent participated in physical education in school (U.S. DHHS, 1999). Participation in school-based physical education classes is declining; daily enrollment dropped from 42 percent of students in 1991 to 25 percent in 1995 (U.S. DHHS, 1996). In addition, one quarter of all U.S. children watch four or more hours of television daily, and hours of television watched is positively associated with increased body mass index and skinfold thickness (Andersen et al., 1998).

Improvements in Physical Activity Needed in Every Age Group. Proposed Healthy People 2010 Objectives (U.S. DHHS, 1998) provide physical activity guidelines for youth and adults, irrespective of weight status. The recommendations proposed for Dietary Guidelines are similar to those proposed in *Healthy People 2010* and are discussed in the next section “Recommendations for Moderate Physical Activity.”

Adults. For persons 18 and older, the *Healthy People 2010* proposed objectives are for 85 percent to participate in leisure-time physical activity and for 30 percent to engage in moderate-intensity physical activity for at least 30 minutes, preferably daily (U.S. DHHS, 1998). Additionally, there is a proposed objective for 25 percent of adults to be vigorously physically active 20 minutes or more daily for cardiorespiratory fitness and another that stipulates increases in activity to build muscular strength, endurance, and flexibility.

Adolescents. For adolescents in grades 9–12, proposed *Healthy People 2010* objectives are for 85 percent to engage in vigorous physical activity three or more days of the week for 20 minutes per session, 30 percent to engage in moderate physical activity five or more days of the week for 30 minutes per session, and for an increase in activity during physical education classes. Data from 1995 show that not one of these objectives is being met (U.S. DHHS, 1998). The Health Education Authority (1998) recommends that young persons be physically active a minimum of 60 minutes daily. The CDC (1997) recommends that children ages 6 years and above engage in moderate physical activity for at least 30 minutes daily, in vigorous activity three or more days per week for at least 20 minutes per session, and in regular activities that improve strength, endurance, and flexibility.

Participation in school physical activity programs for grades 9 through 12 is among the proposed *Healthy People 2010* Objectives. In support of school physical activity programs, a proposed recommendation is to increase the proportion of schools that provide physical activity programs (U.S. DHHS, 1998).

Recommendations for Moderate-Intensity Physical Activity

The committee proposes the following recommendations for physical activity:

Adults. Be physically active (at least 30 minutes most days, preferably all days of the week). The committee continues with the 1995 advice of being moderately physically active for at least 30 minutes on most, preferably all, days of the week, as supported by the CDC and the American College of Sports Medicine (Pate et al., 1995). Since 1995, a number of similar recommendations have been issued for adults and older adults (Mazzeo et al., 1998; NIH Consensus Development Panel on Physical Activity and Cardiovascular Health, 1996; U.S. DHHS, 1996, 1998).

- Split activity into three 10-minute sessions if preferred over a single 30-minute session (Pate et al., 1995).
- Engage in lifestyle or structured activities, depending on preference (Andersen et al., 1999 ; Dunn et al., 1999; Phillips et al., 1996). Examples of lifestyle activities are brisk walking, house cleaning, and lawn care or gardening. Structured activities include aerobics classes, jogging, and swimming laps.
- If already active, do more than 30 minutes of activity, including more vigorous activity (Pate et al., 1995; U.S. DHHS, 1996).
- Increase activity to 45 minutes per day for weight maintenance (Leon et al., 1979; NIH, 1998; Pollock et al., 1998; Rippe and Hess, 1998).
- Build strength and flexibility. The committee recommends weight training, resistance exercises, and stretching to build strength and endurance for children and adults, as discussed under “Health benefits” above. Examples of weight and resistance activities include repetitive light free-weight lifting, using elastic bands, or carrying light loads like groceries. Examples of stretching include yoga and T'ai Chi Chuan.

Although national recommendations include advice on vigorous physical activity, the committee recommends focusing the message only on increasing physical activity in general.

Young persons. Be moderately physically active at least 60 minutes daily (CDC, 1997a; Health Education Authority, 1998). Further, the committee recommends limiting television watching and playing sedentary video or computer games, based on the findings of Andersen and colleagues (1998) described earlier. Although computer games and videos were not mentioned in this report, they are sedentary activities that are similar to watching television.

Content of the New Guideline

The text of the new guideline provides examples of moderate physical activity for adults, children, and adolescents. It lists health benefits of regular physical activity, distinguishes between aerobic activities and those for strength and flexibility, summarizes relationships between physical activity and nutrition, and gives examples of how to make physical activity a regular part of one’s lifestyle. The content of the guideline is consistent with national and

international recommendations (CDC, 1997a; Mazzeo, et al., 1998; NIH, 1998; NIH Consensus Development Panel on Physical Activity and Cardiovascular Health; Pate, et al., 1995; Pollock and Evans, 1999; Pollock et al., 1998; U.S. DHHS, 1996, 1998). The guideline promotes moderate daily physical activity, aerobic activities, and activities for strength and flexibility. The relationship between physical activity and weight maintenance is carried forward from the 1995 Dietary Guidelines and elaborated upon. Brief guidance is provided about precautions when increasing physical activity.

Let the Pyramid Guide Your Food Choices

Guideline

The committee recommends changing the wording of this guideline from "Eat a variety of foods" to "Let the Pyramid guide your food choices." The change was based on three lines of evidence.

First, a key concept to be captured by the guideline is to ensure nutritional adequacy. Following the Food Guide Pyramid, by design, promotes nutrient adequacy (Welsh et al., 1992), and the Pyramid was an integral part of the variety guideline in 1995 for this reason. Research has shown that if variety is interpreted as choosing foods from all the Pyramid food groups (between-group variety), nutrient adequacy is improved (Kant et al., 1991; Krebs-Smith et al., 1987). However, no evidence could be located that demonstrated that choosing a variety of foods within selected Pyramid food groups (within-group variety) promoted, much less ensured, nutritional adequacy. Only one report (Krebs-Smith et al., 1987) was found that examined the separate effects of within-group variety and between-group variety using national survey data. These authors reported only a minor effect of variety within groups after controlling for variety between groups. As a result, the committee concluded that the guideline needed to be more specific about advice given to consumers, and that a specific recommendation to use the Food Guide Pyramid as a guide was more scientifically justified than the broader recommendation to eat a variety of foods.

The second concern addressed by the committee was that advice to consume a variety of foods might promote overconsumption of energy. As people eat a greater variety of foods, they tend to eat more food and thus may be at greater risk of overconsumption. Earlier work from controlled feeding studies has shown that more food is eaten at a meal if a variety of foods is available than if the selection is more limited (Rolls, 1985). A recent observational study (McCrory et al., 1999) examined a possible association of within-group dietary variety and overconsumption. This analysis showed that within-food-group variety was strongly correlated with energy intake. Furthermore, variety within most food groups was also associated with body fatness,

with the exception of the consumption of a variety of vegetables, which was inversely associated with fatness. A study of diets in France also found a positive association of overall dietary variety and energy intake (Drewnowski et al., 1996). In a seeming contradiction, a study of U.S. diets did not find an association of variety with energy intake (Drewnowski et al., 1997). However, these authors noted that their definition of variety was heavily biased in favor of vegetables and fruit, which further supports the concept that a variety of these foods may not be associated with overconsumption of energy.

A third consideration by the committee was that the 1995 variety guideline was not clear to consumers. Several respondents in focus groups indicated that they viewed the variety guideline as a license to consume foods that may not be considered healthy choices (Prospect Associates, 1998). For example, one woman suggested that variety could mean different candy bars, and another felt that people would consider pizza, ice cream, and cake an appropriate variety of foods. In contrast, another focus group study noted that many respondents said the Food Guide Pyramid was the most useful part of the Dietary Guidelines (Systems Assessment & Research, Inc., 1999). Thus, it appears that the focus on variety in the 1995 guideline is too vague to guide consumers to take specific actions. There are no definitions of variety (e.g., whether different forms of the same food qualify), or of a desirable level of variety (e.g., how many different foods should be consumed in a given time period). The committee felt that this lack of specificity detracts from the usefulness of the variety guideline for consumers. If the focus of the text of the 1995 guideline was to encourage consumers to follow the Food Guide Pyramid, then naming the Pyramid in the guideline retains and clarifies this intent. Furthermore, the Pyramid is widely recognized by consumers and is already the core of many nutrition education activities.

Despite the proposed change in the title of the guideline, the committee recommends that the text continue to promote variety within the Pyramid food groups, especially within the grain, fruit, and vegetable groups. The committee concluded that there is merit in this recommendation within the context of following all the Dietary Guidelines. As noted by previous committees, dietary variety promotes enjoyment of food, and there is evidence that consumption of a variety of low-energy foods like fruits and vegetables does not promote overconsumption of energy.

Introductory Paragraph

The text for the first paragraph introduces the Food Guide Pyramid and is similar to the previous edition. The heading regarding varying foods has been omitted as it is not relevant to the reworded guideline.

Use Plant Foods as the Foundation of Your Meals

The committee proposes changes to increase the emphasis on plant foods and on whole grain foods within the grains group (see Grains Guideline).

Keep an Eye on Servings

A new section title is proposed to increase the emphasis on the importance of serving sizes and numbers. The first paragraph in this section refers to Box 7, now named "How Many Servings Do You Need Each Day?" The revised section clarifies that mixed dishes may contain foods from more than one food group (previously covered in "Advice for Today.") The paragraph heading "What counts as a serving?" has been deleted, but the content has been retained and reference is made to box 8, which has that title. The heading "Choose different foods within each food group" has been deleted also. In this case, the content previously under that heading has been revised to be more specific.

There Are Many Healthful Eating Patterns

The committee proposes this heading for the section previously called "What about vegetarian diets?" to make it clearer that many different eating styles can provide adequate nutrition. The change makes the information more suitable for members of groups who avoid dairy products and/or most meats as a part of their cultural heritage and do not necessarily think of themselves as vegetarians. The text under the heading has been revised with these considerations in mind.

Growing Children, Teenagers, Women, and Older Adults Have Higher Needs for Some Nutrients

The committee recommends adding older adults to the list of age groups having higher nutrient needs. The new recommended calcium intake for those ages 51 and older is nearly as high as that for teens (IOM, 1997). The recommended vitamin D intake for those ages 51 through 70 is two times higher than that for younger age groups. For those ages 71 and older, it is three times higher (IOM, 1997).

Check the Food Label Before You Buy

The committee recommends changing the heading previously called "Enriched and fortified foods have essential nutrients added to them" and making the corresponding text more actionable. The section now provides guidance on finding information about added nutrients and provides guidance for using the Nutrition Facts Label.

Some People Need a Vitamin-Mineral Supplement

The heading for this section has been changed to reflect recommendations from the National Academy of Sciences (IOM, 1990, 1991, 1992a, 1997, 1998; NRC, 1989) concerning certain vitamin and mineral supplements.

The first paragraph has been revised to correspond with new recommendations from the Institute of Medicine (IOM, 1997, 1998). (See above regarding vitamin D.) For adults ages 51 and older, it is recommended that a majority of the Recommended Dietary Allowance for vitamin B₁₂ be obtained in the crystalline form, as from fortified food or a supplement (IOM, 1998). The Institute of Medicine recommends that folic acid from fortified food or supplements be used by women capable of becoming pregnant to reduce risk of a neural tube defect-affected pregnancy (IOM, 1998).

The third paragraph clarifies that the term *dietary supplements* now includes herbal products and other substances beyond vitamins and minerals, consistent with the Dietary Supplement Health and Education Act of 1994 (PL 103-417).

Advice for Today

The text now emphasizes the five major food groups of the Food Guide Pyramid (the 1995 text of "Advice for Today" highlighted six, distinguishing protein-rich plant foods from protein-rich animal foods).

Figure 3: How to Read a Food Label

The committee suggests using the new figure developed by the Food and Drug Administration (FDA) for educational purposes. The accompanying text defines how to tell if a food is high or low in a nutrient, using guidelines suggested in FDA educational materials.

Box 7: How Many Servings Do You Need Each Day?

The committee suggests using a box similar to that included with the Food Guide Pyramid (USDA, 1992), but with additions to encourage selection of low-fat dairy foods and lean meats and to discourage selection of other sources of saturated fats and added sugars. This makes the box more consistent with the rest of the Dietary Guidelines. Other minor changes make the box more consistent with new Dietary Reference Intakes for calcium (IOM, 1997).

Box 8: What Counts As A Serving?

The committee recommends specifying *lean* meat. It suggests adding three soy foods and adding notes regarding (1) the differences in portion sizes specified by the Food

Guide Pyramid and the Nutriton Facts Label and (2) lactose-reduced dairy products.

Box 9: Some Sources of Calcium

Minor changes are suggested for readability and to ensure that foods are listed in approximately descending order of calcium content per serving. To be included in the list, foods must usually provide at least 10 percent of the Daily Value (DV) for the serving size specified in Box 8. Calcium-fortified juice, soy-based beverage with added calcium, and breakfast cereal with added calcium have been added to the list of choices; and a note has been added to make it clear that lactose-free and lactose-reduced dairy products provide calcium.

Box 10: Some Sources of Iron

Emphasis on lean meat and poultry is incorporated in the list, and the very high cholesterol foods and high sodium foods are identified. Some of the foods in the list have been changed based on a cut-off point of 10 percent of the DV for iron for servings of the size specified in Box 8. However, enriched and whole grain breads were retained even though a slice of bread provides only 4–5 percent of the DV; because these foods are consumed frequently, they are important sources of iron.

Choose a Variety of Grains Daily, Especially Whole Grains

Guideline

The committee recommends that the 1995 guideline “Choose a Diet with Plenty of Grain Products, Vegetables, and Fruits” be split into two separate guidelines. Splitting the 1995 guideline serves several purposes: it increases attention to grains as distinct from vegetables and fruits, it simplifies the messages, and it helps make clear that there are distinct advantages of the two broad categories of plant foods. Americans come much closer to achieving recommended intakes of grains and vegetables than of fruits (Cleveland et al., 1997). Those who do not meet the recommendation for either grain or fruit intake (approximately 75 percent of the population from the 1989–1991 Continuing Survey of Food Intake by Individuals, CSFII) are likely to have excessive fat intake and lower than recommended fiber intake (Krebs-Smith et al., 1997). Splitting grains from fruits and vegetables should foster better implementation of both guidelines.

Because the recommended intake of calories from grains exceeds that of vegetable and fruits, the committee continues to place the guideline on grains before the guideline for fruits and vegetables.

The committee proposes that variety be emphasized in the grains guideline because of substantial differences in the

nutrient content of different grains. For example, when the nutrient content of 100 grams of dry grain is expressed as a percentage of the Daily Value used on food labels, iron content ranges from 8.2 percent for brown rice to 26.2 percent for oats; dietary fiber content ranges from 14 percent for brown rice to 69 percent for barley; zinc content ranges from 12 percent for cornmeal to 26 percent for oats, and thiamin content ranges from 21 percent for rye to 51 percent for oats (Center for Nutrition Policy and Promotion, U.S. Department of Agriculture, analysis using data from USDA Nutrient Database for Standard Reference, Release 12, June 1999).

The committee recommends that the phrase “especially whole grains” be added for two major reasons:

- (1) Recent research has found that people who consume higher amounts of whole grains have a lower risk for cardiovascular disease, and possibly some forms of cancer, than do people who have a low intake of whole grains (see section “Why choose whole grains?”). This apparently beneficial association of a dietary pattern higher in whole grains is related to factors distinct from their fiber content (Jacobs, Meyer et al., 1998b).
- (2) Intake of whole grains is very low in the United States. A survey of 4,000 U.S. households (demographically matched to U.S. census data on five variables) indicates that the intake of whole grain products averages only about one-half serving per person per day (Albertson and Tobelmann, 1995). A somewhat higher average (one serving per day) was obtained using data from the 1994–1996 CSFII (Food Surveys Research Group, 1999) for all individuals over age 2 years.

Introductory Paragraph

The committee recommends clarifying what grains and whole grains are and briefly explaining the emphasis on variety. The health benefits of grains are now more correctly linked with the consumption of plenty of whole grains (Jacobs et al., 1999), as discussed below.

Why Choose Whole Grain Foods?

Since recent scientific evidence strengthens the concept that whole grain intake may provide health benefits by decreasing the prevalence of coronary heart disease (Jacobs, Meyer et al., 1998; Liu et al., 1999; Pietinen et al., 1996a; Rimm, Ascherio et al., 1996) and possibly some types of cancer (Chatneoud et al., 1998; Jacobs, Jr. et al., 1995; Jacobs, Marquart et al., 1998a; Tavani et al., 1997b), the committee recommends increasing the emphasis on whole grains. Substitution of whole for refined grain may be associated with reductions in a spectrum of chronic disease risks (Jacobs et al., 1999). Recent large prospective association studies have provided evidence for substantial reductions in heart disease risk associated with dietary patterns characterized by high intake of whole grain intake in both men and women in the United States and abroad (Jacobs,

Meyer et al., 1998; Jeppesen et al., 1997; Liu et al., 1999; Pietinen et al., 1996b; Rimm, Ascherio et al., 1996). Intake of whole grains along with fruits and vegetables also may reduce risk of hypertension (Appel et al., 1997). In general, risk reduction in the cited studies was associated with higher levels of whole grain intake and could not be explained by adjustments for fiber intake. This suggests that components of whole grain nutrients other than fiber help reduce risk for coronary heart disease (e.g., Jacobs, Meyer et al., 1998).

Several case-control studies have suggested lower risk with high (vs. low) whole grain intake for colorectal, gastric, and endometrial cancers—and likely other cancers as well (Chatneoud et al., 1998; Jacobs, Jr. et al., 1995; Jacobs, Marquart et al., 1998; Liu, 1998; Tavani et al., 1997a; Witte et al., 1996). Again, beneficial effects appear to be due to a number of components in whole grains, not only fiber. In all these studies, the risk reduction associated with higher intake of whole grains (within the usual range of intakes) appeared to be continuous and without an apparent threshold. Given the current low intake of whole grain products in the general population, increasing the frequency of consumption of whole grains should be quite feasible and, if achieved, may result in substantial reductions of the risks of different chronic diseases. Diets high in whole grain foods also may help avoid excessive energy intake because they tend to be of low energy density (Rolls and Hill, 1998).

Specific mechanisms that explain the associations of higher intakes of whole grains with reductions in chronic disease risk are not defined well. It has been postulated that fiber and other components in whole grains—such as resistant starches, antioxidants (e.g., trace minerals, vitamins, and phenolic compounds), and phytochemicals—could contribute to the putative protective effects (Slavin et al., 1999). More research is needed to identify better how individual components of whole grains interact with biological pathways to slow chronic disease progression. Because whole grains contain a number of components putatively linked to diminishing the activity of harmful cellular pathways, it is probable that multiple mechanisms could be involved in their protective effects.

The committee considered whether or not increasing the intake of whole grains at the expense of enriched, folate-fortified refined grains would decrease the intake of some micronutrients (e.g., iron, folate, zinc) to undesirably low levels. Analyses of dietary patterns using 1994–1996 CSFII composites show that substituting three servings of whole grains for three servings of enriched, folate-fortified refined grains would not adversely affect nutrient intake levels (USDA, Center for Nutrition Policy and Promotion. Unpublished analysis of CSFII 1994–96 intake data, 1999).

Enriched Grains Are a New Source of Folic Acid

This new heading and the revised text point out health advantages of folate intake and that folic acid now is added to enriched grains. In addition to its demonstrated role in the reduction of neural tube defects, a number of studies show that higher intakes of folic acid lower plasma levels of homocysteine, a risk factor for atherosclerosis (e.g., Malinow et al., 1998), and may reduce the risk of coronary heart disease (Rimm et al., 1998) and possibly certain cancers (Giovannucci et al., 1998; Slattery et al., 1999; Stolzenberg-Solomon, et al., 1999). These advantages of enriched grains add support to the recommendation to choose a variety of grains.

Advice for Today

This replaces part of Box 9 and the very short “Advice for Today” section, expanding on the information that is provided about grains. This section reemphasizes eating appropriate numbers and sizes of servings and the inclusion of several servings of whole grains daily.

Box 11: How to Increase Your Intake of Whole Grain Foods

The box has been added to help consumers identify and choose whole grain foods.

Figure 4: Sample Ingredient List for a Whole Grain Food

The committee suggests adding this figure to illustrate how to determine if a food contains a substantial quantity of whole grains. The committee recommends that the term “whole wheat flour” be circled or otherwise highlighted in the figure in the consumer publication.

Choose a Variety of Fruits and Vegetables Daily

Guideline

As discussed under the preceding guideline on grains, the committee recommends that the former guideline “Choose a Diet with Plenty of Grain Products, Vegetables, and Fruits” be split into two separate guidelines. This new guideline focuses attention on fruits and vegetables—two food groups for which few Americans meet intake recommendations (Krebs-Smith et al., 1995). Because barriers to the consumption of fruits and vegetables are different from those for grains (i.e., perishability, appropriate methods of storage and preparation, cost), it was felt that more specific focus and guidance might result in the increased intake of these foods. Fruits are listed before vegetables since fewer people meet the recommended intake of fruits than of vegetables (Food

Surveys Research Group, 1999). The revised wording of the guideline reinforces the message of variety within the fruit and vegetable groups (see discussion below); and it avoids the use of the word "diet," which many consumers consider to be suggestive of restrictions (Systems Assessment and Research, Inc., 1999).

Introductory Paragraph

Potential health benefits from the consumption of fruits and vegetables are identified. With regard to cardiovascular disease, support is summarized in two reviews of human studies (Law and Morris, 1998; Ness and Powles, 1997). The majority of studies that have addressed the issue, either directly assessing fruit and vegetable intake or using surrogate measures of intake (marker nutrients), have suggested that dietary patterns high in fruits and vegetables are associated with a decreased risk of developing cardiovascular disease. Those studies include 6 ecological studies (Armstrong et al., 1975; Artraud-Wild et al., 1993 [folate only]; Bellizzi et al., 1994; Crombie et al., 1990; Gramenzi et al., 1990; Pietinen et al., 1996b), 12 prospective studies (Fehily et al., 1993; Gale et al., 1995; Gaziano et al., 1995; Hertog et al., 1993 [apples]; Joshipura et al., 1999; Knekt et al., 1994 [men only]; Knekt et al., 1996; Kushi et al., 1996; Menotti et al., 1999; Pandey et al., 1995; Rimm et al., 1993 [beta-carotene, smokers only]; Rimm et al., 1995), and 6 case-controlled studies (Gale et al., 1995; Gaziano et al., 1995; Gillman et al., 1995; Khaw and Barrett-Connor, 1987; Lee et al., 1989; Tavani et al., 1997). Those showing no relationship between fruit and vegetable intake and incidence of cardiovascular disease include two ecological studies (Artaud-Wild et al., 1993 [vitamin C and potassium only]; Tzonou et al., 1993), four prospective studies (Gillman et al., 1995; Knekt et al., 1994 [women only]; Lapidus et al., 1986; Rimm et al., 1993 [vitamin C only]); and three case-control studies (Barer et al., 1989; Enstrom et al., 1992; Lapidus et al., 1986;).

Many case-control studies indicate that dietary patterns high in fruits and/or vegetables, or that intakes of selected fruits or vegetables, are associated with a lower incidence of certain kinds of cancer (Agudo et al., 1997; Hertog et al., 1996; Levi et al., 1998; Lindblad et al., 1997; Michaud et al., 1999; Nyberg et al., 1998; Pillow et al., 1997; Schuurman et al., 1998; Slattery, Potter et al., 1997b [along with whole grains]; Terry et al., 1998; Witte et al., 1996). Other investigators (Botterweck et al., 1998; Verhoeven et al., 1997) have found no association of fruit and vegetable intake with the incidence of specific types of cancer. The majority of the evidence supports an inverse relationship between fruit and vegetable intake and the incidence of certain cancers.

A recent trial designed to assess the effect of increasing fruit and vegetable intake on blood pressure with and without increasing non-fat dairy products concluded that

increased intake of fruits and vegetables was associated with decreased blood pressure (Appel et al., 1997).

Why Eat Plenty of Different Fruits and Vegetables?

This paragraph is a simplification of the 1995 paragraph "Plant foods provide a variety of vitamins and minerals essential for health." Specific nutrients highlighted in the paragraph were chosen because they are the ones for which fruits and vegetables are considered major sources in the diet.

Aim for Variety

This proposed new section focuses on variety. It has long been documented that different types of fruits and vegetables differ widely in their content of nutrients. The U.S. Department of Agriculture (USDA) recognizes this in reports on fruit and vegetable intake, in which seven categories of vegetables and two categories of fruits are used. More recently, attention has been directed to the various plant sources of non-nutritive substances that may have a role in health promotion (see review by Steinmetz and Potter, 1996, for example.) Until more is known about specific nutrients or other food components in relation to health, encouraging variety in fruit and vegetable intake promotes the intake of a broad range of nutrients and non-nutritive food components. One large population-based case-control study (Slattery, Berry et al., 1997a) suggests that women with the most diverse pattern of vegetable intake were at lower risk of colon cancer than were women with the least diverse pattern.

This section of the text also makes it clearer that fruits and vegetables with long shelf lives (canned, frozen, etc.) are good choices. In focus groups, consumers have indicated that it is difficult to have plenty of fruits and vegetables since they don't keep well (Communication on Dietary Fats Qualitative Research, 1998).

Find Ways to Include Plenty of Fruits and Vegetables in Your Meals and Snacks

The committee proposes the addition of this new section to provide concrete suggestions for using fruits and vegetables, making the guideline more actionable.

Advice for Today

Compared with the 1995 version, this section has been expanded slightly, especially with regard to desirable choices of fruits and vegetables.

Box 12: Which Fruits and Vegetables Provide the Most Nutrients?

This listing replaces boxes 7, 8 and 14 in the 1995 version and includes encouragement to choose some of the listed fruits and vegetables daily. The information in the box is expanded to include good sources of vitamin C.

Consumption of most of the listed fruits and vegetables is very low, on average, in the United States (Food Surveys Research Group, 1999).

Keep Food Safe to Eat

Basis for the New Guideline

The committee recommends the adoption of an additional guideline: "Keep Food Safe to Eat." The committee views the inclusion of this guideline as a step in unifying and strengthening the focus of the Dietary Guidelines on actionable measures that can be taken by consumers and public officials to keep Americans healthy. That is, the guideline could assist them to make wise food choices and improve their dietary practices. Also, the Dietary Guidelines for Americans are used as a policy blueprint for federal, state, and local public health efforts. At the federal level, food safety has a more explicit focus than ever before in the proposed Year 2010 Objectives for Promoting Health and Preventing Disease (U.S. DHHS, 1998).

Ensuring that food is safe and wholesome is a major responsibility of state and local public health departments and of food handlers in eating establishments and in the home. Existing Dietary Guidelines do not mention food safety. This is an unfortunate omission since only consumers themselves are able to ensure safety once they obtain food. Therefore, the addition of a Dietary Guideline on food safety complements existing measures at other points in the food supply chain. Keeping food safe is a critical element in ensuring that Americans know what and how to eat to stay healthy.

There is a legal basis for considering foodborne illness as an eating-related problem about which Americans need guidance. PL 101-445 Section 3 instructs the relevant Executive Branch departments that the publication *Dietary Guidelines for Americans* shall contain nutritional and dietary information and guidelines for the general public. They are to be based on the preponderance of current scientific and medical knowledge. The President's Council on Food Safety, publications of the Institute of Medicine (IOM, 1992b, IOM/NAS, 1998), the proposed Year 2010 objectives of the U.S. DHHS (1998), articles in the peer reviewed literature (Beuchat et al., 1998; Daniels, 1998; Kapperud et al., 1996; Lindsay, 1997; Payment et al., 1997), publications of the CDC (CDC, 1999), and guidelines of the Food and Agriculture Organization (FAO, 1998b) state that information on foodborne illness is basic information that consumers need, want, and can benefit from.

The text of the proposed guideline covers the following topics:

- *Healthy eating requires that food be safe.* Consumers are one of the many groups that must be involved in the process of ensuring food safety. Other groups include

commercial producers, manufacturers, and food preparers.

- *Foodborne illness is a major preventable public health problem in the United States,* and it may be increasing. Some of the causes of these increases occur between either picking or purchase and consumption and are under the consumer's control. Therefore, foods must be handled safely from the garden or market to the table.
- *Consumers can apply simple food handling practices to minimize their risk of foodborne illness.* These practices complement safe food handling practices at other points in the food safety chain.

The scientific basis for covering each topic is given below.

Healthy Eating Requires That Food Be Safe. There are many hazards along the food chain from production to market. Those who commercially raise, produce, process, or prepare food have a legal obligation and duty to keep foods safe. Fulfilling their responsibilities is critical, since the sources of much foodborne illness arise before foods reach the market or food service operations outside the home (IOM/NAS, 1998). The Hazard Analysis and Control Point (HACCP) approach to keep foods safe is essential, as are other programs to minimize pre-market food hazards (Ralston, 1999). Safe preparation by food preparers in eating establishments is especially important since consumption of food away from home is rising in the United States (Lin et al., 1999).

Many foods have the potential to cause foodborne illness if they are handled incorrectly. Some foodborne illnesses, such as staphylococcal food poisoning and salmonellosis, are acute. They occur after a one-time intake of enough toxins or microorganisms to cause illness. Other foodborne illnesses have long-term effects and complications. For example, hemolytic uremic syndrome is a serious complication caused by *E. coli* O157:H7; and chronic joint diseases can follow campylobacteriosis, *E. coli* enteritis, salmonellosis, shigellosis, and yersiniosis (FSIS, 1997a; Lindsay, 1997).

Everyone is at risk from eating unsafe food, but foodborne illness is a special hazard for vulnerable individuals including pregnant women, the elderly, the very young, the many people who are being treated with immunosuppressive medications, those infected with HIV, and others who are immunocompromised. Vulnerable individuals become ill more readily, and foodborne illness is more serious and more likely to lead to death of vulnerable persons than of healthy persons. Foods that can transmit listeriosis or toxoplasmosis pose especially severe risks for pregnant women and their fetuses.

In the United States, bacteria are the major cause of the foodborne illnesses that have been identified by current surveillance for foodborne illness outbreaks (Bean et al., 1996). Underreporting of foodborne illness is considerable,

because the reporting system is passive and largely depends on the affected individuals seeking help for their illnesses. Many such illnesses go unrecognized. At least four factors are necessary for bacterial foodborne illness to occur: (1) bacterial cells or spores; (2) a food vehicle; (3) conditions that allow bacteria to survive, reproduce, or form a toxin; and (4) a susceptible person who ingests enough of the bacteria or toxin to cause illness. Perishable foods such as eggs, meats, poultry, fish, shellfish, and milk can harbor bacteria and are the most common sources of problems. If fruits, vegetables, or grains are contaminated, they also can become a source of risk. Contamination of one food by another spreads the risk.

In addition to considering problems caused by microorganisms, the committee considered food safety issues such as pesticide residues, genetically altered foods, parasites, contamination with filth, additives, and dangers in undefined food supplements. Although these risks were judged as also having merit for inclusion in the proposed guideline, the documented prevalence of these food safety problems is very much less than that of illness caused by microbes (Bean et al., 1996); and few steps are available to consumers to address the nonmicrobial problems. The current regulatory system appears adequate to address concerns about exposure to pesticide residues in food. Some contamination with filth and pesticides can be decreased by appropriate cleaning and handling of fruits, vegetables, and sprouts before, as well as after, they are purchased.

Foodborne Illness Is a Major Preventable Public Health Problem in the United States, and It May Be Increasing. The number of reported cases of foodborne illness, around 15,500 per year, is believed to represent a very small fraction of the total number of cases (CAST, 1994; CDC, 1998). Most cases of foodborne illness do not come to the attention of health providers, are not diagnosed, or are not reported to public health authorities even if diagnosed. Thus, the actual number of occurrences of foodborne illness can be estimated only roughly. One such estimate is 6.5 to 33 million illnesses yearly (U.S. GAO, 1996). Even the most conservative estimates are troubling and represent a considerable burden of illness. CDC workers (Bean et al., 1996) found that 18 percent of outbreaks reported in its surveillance system from 1988–1992 occurred at home; either from foods prepared at home or convenience and take-out foods eaten at home. The estimated costs in lost productivity of Americans ranges between \$20 billion and \$40 billion yearly (Buzby et al., 1996; FDA, USDA, EPA and CDC, 1997). It is not known to what extent factors under consumers' control contribute to the incidence and costs of foodborne illness. However, recent observational surveys by the CDC show that high-risk food handling, preparation, and consumption behaviors are common among both consumers and food handlers (Yang et al., 1998). Additionally, two observational studies (Altekroose et al., 1999; Daniels, 1998) indicate that improved practices are needed in many U.S. homes. Unsafe

food consumption and preparation practices have been linked with congenital toxoplasmosis in pregnant women, which causes blindness in the fetus (Kapperud et al., 1996).

The problem of foodborne illness may be increasing because of an increase in the number of vulnerable individuals, the emergence of more virulent pathogens, and perhaps the introduction of new hazards through the increasingly global nature of the food supply and the centralized nature of the food distribution system (IOM, 1992b). Even without an increase in the actual number of cases, the number of reported cases is expected to increase because of improvements in reporting systems. National monitoring and surveillance of foodborne disease are coordinated by the CDC Food Net and by the National Alert and Response Monitoring System. Other offices of the CDC, the Food Safety and Inspection Service of USDA, and FDA provide technical assistance.

Consumers Can Apply Simple Food Handling Practices to Minimize Their Risk of Foodborne Illness. Efforts to keep food safe and reduce the risk of foodborne illness can be made whenever and wherever food is handled or stored for example, during food production, distribution, and preparation in eating establishments or at home. Consumers can keep foods safe by taking steps to destroy microorganisms and other pathogens that are in the food at the time of purchase, preventing contamination of food with microorganisms, and preventing their growth in foods within the home. Most steps taken to keep food safe from harmful bacteria also reduce risks from other organisms. Preventive measures to minimize bacterial foodborne illnesses are easy to learn and apply. These include thorough cooking of foods to destroy harmful bacteria, using thermometers to check the temperature of cooked animal foods (FSIS, 1997b), using refrigerators and freezers to store foods, keeping raw and cooked foods separate, thorough cleaning of hands and other objects and surfaces that come in contact with food, and holding and storing foods at safe temperatures.

Content of the New Guideline

The new guideline contains seven simple messages targeted to actions that consumers can take whenever they are preparing, serving, and storing food:

- Clean. Wash hands and food surfaces often.
- Separate. Separate raw, cooked, and ready-to-eat foods while shopping, preparing, or storing.
- Cook. Cook foods to a safe temperature.
- Chill. Refrigerate perishable foods promptly.
- Follow the label.
- Serve safely.

- If in doubt, throw it out.

Each of the messages in the proposed guideline is consistent with well-established principles of microbiology and sanitation (CAST, 1994; IOM, 1992b). These are messages that have long been used by the USDA to teach food safety. The first four messages (clean, separate, cook, chill) are essentially identical to the FightBAC! messages of the Partnership for Food Safety Education. The FightBAC! messages were developed from the consensus of food safety experts and have been tested for consumer comprehension. The last three messages in the proposed guideline ("Follow the label;" "Serve safely;" and "If in doubt, throw it out") provide additional guidance to ensure that food will be safe and wholesome. Each message is easy to understand and follow. The proposed text identifies the groups of people who are most vulnerable to foodborne illness because they or those who care for them need to pay special attention to safe food handling.

Choose A Diet That is Low in Saturated Fat and Cholesterol and Moderate in Total Fat

Guideline

The 1995 recommendation stated "Choose a Diet Low in Fat, Saturated Fat, and Cholesterol." The committee recommends changing the wording of the guideline to place greater emphasis on reducing intake of saturated fat and cholesterol. This recommendation is based on strong scientific evidence that high intakes of saturated fat and cholesterol contribute to the development of coronary heart disease. The committee concluded that the scientific evidence does not support assigning first priority to a diet low in total fat. In fact, changing perceptions of what constitutes a "low fat diet" led the committee to recommend a diet *moderate* in total fat. This change in wording accords better with the recommended numerical intake of total fat. Throughout the guideline, emphasis is placed on food choices that will assist consumers to achieve a lower saturated fat intake.

Introductory Paragraph

As in the 1995 version, the introductory paragraph identifies both positive and negative health aspects of dietary fat. The text concerning current fat intake is updated (although the percentage of energy from fat in the American diet has fallen, total fat intake is not lower than in the recent past [Anand and Basotis, 1998]). This paragraph continues to point out that high intakes of fat potentially contribute to overconsumption of energy. Because relationships between fat intake and cancer are inconclusive and currently under investigation, they are deleted. The putative cancer-fat intake relationship is discussed later in this rationale.

Choose Foods Low in Saturated Fat and

Cholesterol

The committee recommends replacing the sections "Foods high in fat should be used sparingly" and "Choose a diet low in fat" with a section that focuses mainly on foods low in saturated fat. This is consistent with the greater emphasis on saturated fat. For ease of application by the consumer, the committee suggests addressing both saturated fat and cholesterol in the information on food choices. The guidance is consistent with the recommendation of the National Cholesterol Education Program (1994) that all Americans eat a diet containing 8 to 10 percent of energy from saturated fat. Saturated fat is not required for human health, and no lower limit of saturated fat intake has been identified. The scientific foundation for the relationship between dietary saturated fats and coronary heart disease consists of multiple lines of evidence.

Many years of epidemiological research have shown that populations consuming diets high in saturated fats have relatively high levels of serum cholesterol and carry a high prevalence of coronary heart disease (Kagan, et al., 1974; Keys, 1970; Kromhout et al., 1984; Kushi et al., 1985; Marmot et al., 1975; McGee, et al. 1984, 1985; Shekelle et al. 1981; Worth et al., 1975). This relationship continues to be observed in more recent epidemiological studies (Caggiula and Mustad, 1997; Esrey et al. 1996; Hu et al. 1997; Kromhout et al., 1996; Pietinen et al., 1996; Singh et al., 1998).

Research in experimental animals shows that saturated fats raise the serum cholesterol levels and produce atherosclerosis (Goldsmith and Jacob, 1978; Rudel et al., 1995; Rudel, 1997; Strong et al., 1994; Wissler et al., 1983). Reports from many earlier clinical investigations document that saturated fats raise serum cholesterol levels (Bonanome and Grundy 1988; Denke and Grundy, 1991, 1992; Grundy 1986; Grundy and Denke, 1990; Mattson and Grundy, 1985; Mensink and Katan, 1989; 1992; Zock et al., 1994). Further abundant evidence in both animals (Ishibashi et al. 1994; Kita et al., 1981; Kushwaha and McGill, 1998) and humans (Kannel, et al. 1971; Law et al., 1994; The Pooling Project Research Group, 1978; Stamler et al., 1986) documents that high levels of serum cholesterol, particularly low density lipoprotein (LDL) cholesterol, promote the development of atherosclerosis and predispose to coronary heart disease. Controlled clinical trials show that lowering LDL-cholesterol levels will reduce the risk for coronary heart disease significantly. These results provide convincing confirmation that LDL cholesterol is a direct cause of coronary heart disease (Brown, et al., 1993; Downs et al., 1998; Lipid Research Clinics Program, 1984; The LIPID Study Group, 1998; Sacks et al., 1996; Scandinavian Simvastatin Survival Study Group, 1994; Shepherd et al., 1995).

In the past 5 years, the concept has become accepted widely that lowering LDL cholesterol by virtually any safe means will reduce the risk for coronary heart disease (Gould et al., 1998). Reducing serum cholesterol levels by dietary means has been shown to be effective in decreasing the risk for coronary heart disease. The most definitive evidence comes from a meta-analysis by Gordon (1995a,b) of six dietary trials, in aggregate including 6356 patients (Dayton et al., 1968; Leren, 1966; Research Committee to the Medical Research Council, 1968; Watts et al. 1992; Woodhill et al., 1978). This analysis revealed that lowering serum cholesterol levels by decreasing intakes of saturated fats achieved a statistically significant 24 percent decrease in the incidence of coronary heart disease. In addition, reducing saturated fat intake produced a trend towards a decrease in coronary mortality (21 percent) and total mortality (6 percent). In these trials, non-cardiovascular mortality did not increase with diets low in saturated fats. The results of these dietary trials (Gordon, 1995a,b), which are augmented by controlled clinical trials with cholesterol-lowering drugs (Gould et al., 1998), strongly support the committee's conclusion that reducing serum cholesterol by decreasing the intake of saturated fats will lower the risk for coronary heart disease.

The committee suggests changes in the booklet to make it easier for the consumer to understand how to lower intake of saturated fat. The initial focus is on the selection of types of food that are low in both saturated fat and cholesterol. Then the consumer is told about using Box 17 if more flexibility in food choice is desired. Because the calculation of fat gram limits is complicated, the committee recommends deleting the description of the calculation method that appeared in the 1995 booklet.

With this section and Box 15, the previous section "Choose a diet low in cholesterol" would be redundant. The committee supports the 1995 recommendation that Americans should limit intake of dietary cholesterol and specifies 300 mg per day a value that is consistent with the recommendations of authoritative bodies (National Cholesterol Education Program, 1994).

Keep Fat Intake Moderate

This paragraph addresses total fat intake and reiterates the point that cutbacks should be made largely in intake of saturated and *trans* fats. A notable change from the 1995 recommendation is the placement of total fat after that of saturated fat and cholesterol in the guideline. The current committee concluded that the 1995 recommendation carries the danger of turning attention away from the primary offender, saturated fat, and towards total fat, where the evidence of causality of chronic disease is less conclusive.

Dietary data show parallel decreases in fat and saturated fat as a percentage of energy over the past 5 years. Saturated fat intake decreased from 12 to 11 percent and total fat

intake decreased from 34 percent to 33 percent of calories (U.S. DHHS, 1999). If intakes of foods high in saturated fats are reduced, there likely will be some decrease in absolute intake of total fat. A greater decrease in absolute intake of saturated fat would be expected with a focus on saturated fat. Such a decrease likely also would result in a reduction in the percentage of energy intake provided by total fat.

The proposed change in terminology from *low* to *moderate* represents the committee's view that a change in perception has occurred in the meaning of these two terms with respect to total fat. This change is not accompanied by a change in the numerical recommendation (30 percent) for the maximum percentage of energy provided by fat. In part, this change represents a growing view that recommendations for low-fat diets could lead to a less healthy ratio of unsaturated fat to carbohydrates in the American diet. However, it may be anticipated that the change in terminology from *low* to *moderate* may be perceived as less restrictive by allowing total fat to approach the 30 percent level. In the discussion to follow, the term *high fat* refers to total fat intake of approximately 40 percent of calories, *moderate fat* to approximately 30 percent, and *low fat* to approximately 20 percent.

There has been a long-standing belief among experts in nutrition that low-fat diets are most conducive to overall health. This belief is based on epidemiological evidence that countries in which very low fat diets are consumed have a relatively low prevalence of coronary heart disease, obesity, and some forms of cancer. For example, low rates of coronary heart disease have been observed in parts of the Far East where intakes of fat traditionally have been very low (Xie et al., 1998). However, populations in these countries tend to be rural, consume a limited variety of food, and have a high energy expenditure from manual labor. Therefore, the specific contribution of low-fat diets to low rates of chronic disease remains uncertain. Particularly germane is the question of whether a low-fat diet would benefit the American population, which is largely urban and sedentary and has a wide choice of foods.

Largely because of cross-cultural comparisons of fat intakes and body weight, one persistent concern on the part of many investigators is that a higher percentage of energy from dietary fat may promote the development of obesity. One theory holds that the high caloric density of high-fat foods facilitates the consumption of an excess of calories. This theory is supported by research in laboratory animals (West and York, 1998). It also has been supported by some short-term studies in humans since 1995 (Astrup, 1996; Astrup et al., 1997; Jeffery et al., 1995; Nelson and Tucker, 1996; Proserpi et al., 1997; Schutz, 1995; West and York, 1998). Limited epidemiological data within populations provide some additional support for this theory (Heitmann et al., 1995; Lissner and Heitmann, 1995). The combined evidence for a link between high-fat diets and obesity has

been updated in recent reviews of the literature (Blundell et al., 1996; Bray et al., 1998; Golay and Bobbioni, 1997). In spite of evidence to support this theory, there is a growing body of counterbalancing data from a number of experimental and population studies that raises questions about the effect of the percentage of energy from dietary fat on body weight (Harvey-Berino, 1998; Heini and Weinsier, 1997; Hirsch et al., 1998; Leibel et al. 1992; Rolls and Bell, 1999; Rolls et al. 1999; Saltzman et al., 1997; Seidell, 1997, 1998; Shah and Garg, 1996; Willett, 1998). Thus, the theory that a high percentage of fat contributes to obesity in the American public may warrant placing a ceiling on total fat, but it is not strong enough to make a definitive recommendation for a low-fat diet.

Another long-standing argument for a "low-fat diet" is based on the theory that dietary fat contributes to the development of various forms of cancer, especially cancers of the breast, colon, and prostate gland. The evidence for this theory derives from early studies in laboratory animals (Tannenbaum, 1942) and epidemiological studies, particularly cross cultural studies (Greenwald et al. 1997; Harrison and Waterbor, 1999; Slattery, Potter et al. 1997). The evidence for a possible link between dietary fat and breast cancer was considered by the National Cancer Institute to be strong enough to justify spending public funds on a low-fat trial as part of The Women's Health Initiative (1998), which is scheduled to end in 2005. The rationale for this trial is based on international food disappearance data (Prentice and Sheppard, 1990) and migrant and time-trend studies (Kliewer and Smith, 1995; Kolonel, et al. 1981; McMichael and Giles, 1988; Ziegler et al. 1993). Several recent epidemiological investigations, mainly prospective studies within populations, offer little support for a significant relationship between the percentage of fat in the diet and various forms of cancer (Franceschi et al., 1996; Giovannucci and Goldin, 1997; Holmes, et al. 1999; Honda et al. 1999; Hunter, et al. 1996; Kolonel 1996; Kolonel et al. 1999; de Lorgeril et al, 1998; LaVecchia and Favero, 1998; Potter 1996; Rose, 1997; Veierod, et al., 1997; Willett 1997, 1998; Wolk et al. 1998). These recent studies led the committee to conclude that the weight of evidence concerning the contribution of a high-fat diet to cancer incidence in the U.S. population is not strong enough at the present time to justify recommending a low fat intake for the entire population.

One concern about recommending a percentage of fat well below 30 percent of calories relates to the potential for adverse metabolic effects of low-fat, high-carbohydrate diets in the U.S. population. The metabolic changes that accompany a marked reduction in fat intake could predispose to coronary heart disease and type 2 diabetes mellitus. For example, reducing the percentage of dietary fat to 20 percent of calories can induce a serum lipoprotein pattern called atherogenic dyslipidemia, which is characterized by elevated triglycerides, small-dense LDL, and low high-

density lipoproteins (HDL) (Grundy, 1998; Krauss, 1998). This lipoprotein pattern apparently predisposes to coronary heart disease (Austin et al. 1990). This blood lipid response to a high-carbohydrate diet was observed earlier (Grundy, 1986; Mensink and Katan, 1987) and has been confirmed repeatedly (Archer et al., 1998; Blades and Garg, 1995; Brown and Cox , 1998; Chen et al.,1995; Dreon et al., 1994, 1999; Garg, 1998; Garg et al., 1994; Gumbiner et al., 1998; Jarvi et al., 1999; Jeppesen et al.,1997; Katan, 1997, 1998; Krauss and Dreon, 1995; McDonald, 1999; Morgan et al., 1997; Nelson et al., 1995; Starc et al., 1998; Turley et al., 1998). Consumption of high-carbohydrate diets also can produce an enhanced post-prandial response in glucose and insulin concentrations (Garg et al., 1992, 1994;). In persons with insulin resistance, this response could predispose to type 2 diabetes mellitus.

Another reason for not overly restricting intake of total fat comes from evidence that populations consuming higher quantities of unsaturated fats have a favorable profile of blood lipoproteins and a relatively low prevalence of coronary heart disease, provided that intakes of saturated fats are low. Thus, the recommendation for a diet *moderate* in total fat is based in part on the recognition that unsaturated fats carry potential benefits. Dietary studies have demonstrated that both polyunsaturated and monounsaturated fats reduce LDL-cholesterol levels when they are substituted for saturated fats (Ahrens et al., 1957; Hegsted et al. 1965; Keys et al., 1965; Mattson and Grundy, 1985; Mensink and Katan, 1989; 1992). Moreover, epidemiological studies (Gjonca and Bobak, 1997; Keys, 1970; Renaud et al. 1995; Wolk et al., 1998) have shown that populations that consume relatively high intakes of unsaturated fats, particularly monounsaturated fats, have low rates of both coronary heart disease and cancer. In addition, clinical trials strongly suggest that substitution of N-6 polyunsaturated fats for saturated fats reduces the risk for coronary heart disease (Gordon 1995a,b; Katan et al. 1997). Recent clinical trials further find that N-3 polyunsaturated fatty acids reduce risk for myocardial infarction in patients with established coronary heart disease (Burr et al., 1989; GISSI-Prevenzione Investigators, 1999). Finally, a higher intake of unsaturated fats offers the public a safe alternative to saturated fats while retaining the organoleptic qualities of a moderate fat intake.

The committee further held the concern that the previous priority given to a "low-fat intake" may lead people to believe that, as long as fat intake is low, the diet will be entirely healthful. This belief could engender an overconsumption of total calories in the form of carbohydrate, resulting in the adverse metabolic consequences of high-carbohydrate diets. Further, the possibility that overconsumption of carbohydrate may contribute to obesity cannot be ignored. The committee noted reports that an increasing prevalence of obesity in the United States has corresponded roughly with an absolute increase in carbohydrate consump-

tion (Anand and Basiotis, 1998). Finally, with a “low-fat” recommendation, the potential benefit to be derived from the several forms of unsaturated fats may not be realized.

Advice for Children

The committee recommends changing this section to make it clear that the guidelines apply to children beginning at age 2 years. There is no evidence that current recommendations for adults need to be modified for children who are 2 years of age or older. Studies support the safety for children of diets that are low in saturated fat and cholesterol and moderate in total fat as described under this guideline (Lauer et al., 1996; Niinikoski et al., 1997; Obarzanek et al., 1997).

Advice for Today

This section omits the recommendation to use vegetable oils sparingly and suggests substituting them for saturated fats. It focuses on saturated rather than total fat.

Box 15: Know the Different Types of Fats

The committee suggests the addition of this box to help the reader distinguish among the different kinds of fats—saturated, *trans*, and unsaturated. It specifies the effects of each type of fat on the blood cholesterol level. *Trans* fatty acids are included because a definitive body of recent experimental evidence indicates that *trans* fatty acids raise the concentration of the most dangerous form of serum cholesterol (LDL-cholesterol) (Aro et al. 1997; Judd et al., 1994; Lichtenstein, et al. 1993, 1999; Mensink and Katan, 1990; Zock and Katan, 1992;). *Trans* fatty acids also tend to lower a protective form of serum cholesterol (HDL cholesterol). Prospective epidemiological studies further note that higher intakes of *trans* fatty acids are associated with a higher incidence of coronary heart disease (Pietinen et al., 1997; Willett et al., 1993).

The box also lists the major sources of each type of fat and of dietary cholesterol. The unsaturated fats in fatty ocean fish are specifically mentioned because of a growing interest in omega-3 fatty acids as possibly protective against heart disease.

Box 16: Food Choices Low in Saturated Fat and Cholesterol and Moderate in Total Fat

The committee recommends revision of former Box 11 to emphasize saturated fat rather than total fat. In the suggested revisions, guidance on cutting back on added fat is tied in with weight control. Less detail is provided on the fat content of specific foods.

Box 17: What is Your Upper Limit on Fat for the Calories You Consume?

This is a revision of box 10 from the 1995 bulletin. The revised box gives upper limits for saturated fat intake levels

and retains the same limits on total fat. The saturated fat limits correspond to 10 percent of calories at the three calorie levels represented by the Food Guide Pyramid.

Box 18: A Comparison of Saturated Fat in Some Foods

To further help consumers to understand the effect of different food choices on saturated fat intake, the committee recommends the inclusion of Box 18 (Subar et al., 1998 a, b).

Choose Beverages and Foods That Limit Your Intake of Sugars

Guideline

The committee recommends changing the wording of the guideline to include the word *limit* because intake of sugars has increased steadily since the early 1980s. It suggests adding the word *beverages* because they are the primary source of added sugars in U.S. diets.

Introductory Paragraph

The committee recommends that the first paragraph emphasize the role of limiting sugars for the prevention of dental caries, as this is the principal diet and health association. Only minor changes are suggested in the text that addresses dental caries. Diet plays a central role in the development of dental caries. Observations in humans have shown clearly that frequent and prolonged oral exposure to certain carbohydrates (primarily glucose, fructose, and sucrose) is fundamental to caries activity (Fitzsimons et al., 1998). There is abundant epidemiological evidence that sugars, and especially sucrose, are the main dietary factor affecting dental caries prevalence and progression (Depaola et al., 1999). Sugars increase caries most if they are consumed between meals, and in a form that is retained in the mouth for a long time (Kandelman, 1997).

Intake of Sugars Is Increasing

Proposed Content. The committee recommends highlighting the increasing intake of sugars in a new section of the guideline. Although dental caries continue to provide a major rationale for this guideline, the committee expressed very serious concern about current trends in the consumption of sugars by the U.S. population. These trends raised concerns because of their coincidence with other undesirable changes in the country’s nutritional well-being, e.g., increasing rates of obesity and inadequate intakes of calcium that carry a risk of impaired long term bone health. Further discussion of these trends follows the description of the proposed contents of this section.

The committee recommends that this section of the booklet distinguish added sugars from naturally occurring sugars, identify main sources of added sugars, and give an

additional reason for moderating intake of foods high in added sugars. Distinguishing added sugars from naturally occurring sugars is consistent with the approach used by the Department of Health in the United Kingdom (FAO, 1998a) and by the USDA in its analyses of the nutrient intake of Americans in nationwide surveys. Added sugars are defined as all sugars used as ingredients in processed and prepared foods, such as bread, cake, soft drinks, jam, and ice cream, as well as sugars eaten separately. Sugars occurring naturally in foods such as fruit and milk are excluded (Cleveland et al., 1997). Specifically, added sugars include white sugar, brown sugar, raw sugar, corn syrup, corn syrup solids, high fructose corn syrup, malt syrup, maple syrup, pancake syrup, fructose sweetener, liquid fructose, honey, molasses, anhydrous dextrose, and crystal dextrose (USDA, 1998b).

The committee suggests drawing attention to the major sources of added sugars in U.S. diets. Foods and beverages high in added sugars include cakes, cookies, candies, soft drinks, jam, ice cream, fruitades and juice drinks, and sugars eaten separately or added to foods at the table (USDA, 1998b). According to data from the 1994–96 CSFII, the most important source of added sugars is nondiet soft drinks: they account for one-third of added sugars intake (Guthrie and Morton, 2000). Sugars and sweets (such as candies) contribute 16 percent of added sugars, sweetened grains contribute 13 percent, fruitades and fruit drinks made with added sugars provide 10 percent, and flavored milk and other sweetened milk products provide 9 percent. Together, these foods and beverages provide over three-fourths of the total intake of added sugars (Guthrie and Morton, 2000).

The committee recommends deleting the general information about carbohydrates and the listing of reasons why sugars may be added to foods. Instead, the proposed section gives more explanation of food label information.

Background on Trends in Added Sugars Intake and Reasons for Concern. A substantial increase in sugars intake over time is documented by a variety of data sources. Based on time series analysis of food supply data, total consumption of added sugars has risen steadily since 1970 (Putnum and Allshouse, 1999). Between 1982 and 1996, caloric sweetener consumption increased 16 percent. The 1994–1996 CSFII documented that the mean intake of added sugars ranged from 12 percent of total calories in females ages 51 years and above to 20 percent of total calories in males and females ages 12 to 17 years (Guthrie and Morton, 2000). Soft drinks contributed 27 percent of the total intake of added sugars.

Since 1990, on average, Americans increased their energy intake. This increase came primarily from increased carbohydrate consumption (Anand and Basiotis, 1998). Much of the increased energy intake by children and adolescents has been attributed to increased consumption of nondiet soft drinks (Morton and Guthrie, 1998). Soft drink consumption among children ages 2 to 17 years increased

from a mean of 198 grams (about 6.9 ounces) per day in 1989–1991 to 279 grams (about 9.5 ounces) per day in 1994–1995 (Morton and Guthrie, 1998).

Nationwide food intake survey data for all age groups demonstrate that consumption of soft drinks and other sweetened beverages like fruitades and tea increased dramatically over the past decade (Borrud et al., 1997; Morton and Guthrie, 1998). Based on analysis of USDA nationwide food intake data obtained in 1977–1978 and 1994–1996 (Tippett and Cleveland, 1999), consumption of soft drinks increased 130 percent—from 144 grams to 332 grams. On a per capita basis, yearly consumption of soft drinks increased from 22 gallons in 1970 to 40 gallons in 1994 and to 41 gallons in 1997 (Gerrior et al., 1998). The average nondiet soft drink has 9 teaspoons of added sugars for a 12-ounce container. Consumption of sweetened milk desserts (including ice cream) increased 29 percent.

Other data suggest that a significant proportion of the population may not be meeting its needs for calcium and other nutrients because of their displacement by the increased consumption of sweetened beverages. Nationwide food intake data between 1977 and 1994 indicate that milk consumption declined 24 percent among boys and 32 percent among girls 6 to 11 years of age (Borrud et al., 1997). In a study of beverage intake at the noon-time meal, Johnson and colleagues (1998) found that, on average, only children who drank milk at that meal achieved the recommended intake (RDA) for calcium for the day. From 1989 to 1995, while calorie intakes increased for children ages 2 to 17 years, micronutrient intakes (except for iron) did not increase; and calcium intakes decreased (Morton and Guthrie, 1998). In addition, children who were high consumers of nondiet soft drinks had lower intakes of riboflavin, folate, vitamin A, vitamin C, calcium, and phosphorus in comparison with children who were non-consumers of soft drinks (Harnack et al., 1999). Several of these nutrients (folate, vitamin A, and calcium) have been identified in national surveys as “shortfall” or “problem” nutrients among various age and gender groups (USDA, 1998a).

Using 1990–1991 cross-sectional data, Guthrie (1996) found that women whose diets met their RDA for calcium consumed significantly more milk products, fruit, and grains but less nondiet soft drinks than did women who did not meet their calcium recommendation. Others have shown that intakes of soft drinks are negatively related to intakes of milk (Guenther, 1986; Harnack et al., 1999; Skinner et al., 1999).

Adequate calcium intake is of particular concern during childhood and adolescence since 45 percent of the adult skeleton is built and enlarged during adolescence (NIH Consensus Development Panel on Optimal Calcium Intake, 1994). Inadequate consumption of calcium during the first two decades of human growth is associated with reduced

peak bone density in adult life and increased risk of osteoporosis (IOM, 1997). It has been estimated that osteoporosis currently affects 25 million people in the United States and is responsible for 1.5 million fractures annually at a cost in excess of 10 billion dollars per year to the U.S. health care system (NIH Consensus Development Panel on Optimal Calcium Intake, 1994).]

New recommendations for calcium intake were set in 1997 at levels associated with maximum retention of body calcium (IOM, 1997). Translated into dietary habits, it is recommended that most Americans consume 2 to 3 servings a day of foods high in calcium. Nonetheless, USDA's food intake survey data indicate that Americans ages 2 years and over consumed an average of 1.5 servings a day of high-calcium dairy foods in 1994–1996 (Gerrior et al., 1998). The increased intake of beverages high in added sugars is of concern because it may indicate that they are being consumed in place of calcium-rich beverages.

Hence, the committee recommends the identification of the kinds of beverages and foods that are the major contributors of added sugars in American's diets (see box 20). Intake of some of these foods has been shown to be inversely associated with the consumption of beverages and foods that are richer in essential nutrients, such as milk, fruit and fruit juices, and grains (Guthrie, 1996; Harnack et al, 1999).

In two large dietary surveys (Farris et al. 1998; Gibney et al. 1995), there were no consistent associations between intake of total sugars and nutrient adequacy. That is, consumers (both children and adults) of large amounts of total sugar did not necessarily have poorer quality diets in comparison with consumers with low total sugar intakes. However, this is expected since total sugar intake includes naturally occurring sugars from nutrient-dense foods such as fruits (fructose) and milk (lactose). Gibney and colleagues (1995), for example, reported that dairy foods contributed 31 percent of the total sugars intake in children, and fruits contributed 17 percent of the sugars for all ages.

Sugar Substitutes

The content of this section is essentially unchanged except for the addition of acesulfame potassium and sucralose as Food and Drug Administration approved sugar substitutes.

Sugars and Other Health Problems

This section replaces “Sugars, health, and weight maintenance.”

A meta-analysis of 23 studies conducted over a 12-year period concluded that there is little objective evidence that intake of sugars has a significant influence on either behavior or cognitive performance in children (Wolraich et al., 1995). Thus, a sentence has been added to address this point.

The paragraph concerning weight control has been shortened and no longer refers to the Food Guide Pyramid. There is little evidence that diets high in total sugars are associated with obesity (Gibson, 1996). Hence, there is no direct link between the trend toward higher intake of sugars and increased rates of obesity. However, their concomitant occurrence and the severe consequences of increased obesity suggest the need to monitor potential causal links among diet and other behaviors (e.g., physical activity) and rates of obesity and overweight. The lack of association between intake of added sugars and obesity may be partially due to the pervasive problem of underreporting of food intake which is known to occur with dietary surveys (Black et al., 1993). Underreporting is more prevalent and severe among obese adolescents and adults than among their lean counterparts (Bandini et al., 1990; Lichtman et al., 1992; Prentice et al., 1986). In addition, intakes of foods high in added sugar are known to be underreported to a greater extent than of other foods (Poppitt et al., 1998). Hence, it is difficult to draw conclusions about associations between sugar intake and body mass index using self-reported dietary data.

Children's energy intake has been positively associated with consumption of nondiet soft drinks. Mean adjusted energy intake was 188 kilocalories per day higher for children who consumed an average of 9 ounces of soft drink per day in comparison with children who were nonconsumers of nondiet soft drinks (Harnack et al., 1999). However, there was no indication that soft drink consumption was associated with BMI in this study.

Reference to diabetes mellitus has been removed. Two large, prospective cohort studies in men and women reported an increased risk of type 2 diabetes mellitus associated with diets with a high glycemic index (Salmeron, Ascherio et al., 1997a; Salmeron, Manson et al., 1997b). The paucity of evidence at this time makes it difficult to determine if diets high in sugars are linked with the etiology of non-insulin dependent diabetes.

Advice for Today

The committee suggests including a focus on limiting foods high in added sugars, encouraging intake from the five basic food groups, drinking water, and not letting sweets crowd out foods higher in nutrients.

Box 19: For Healthy Teeth and Gums

The committee recommends the addition of a bullet concerning rinsing the mouth after eating dried fruit.

Box 20: Major Sources of Added Sugars in the United States

Box 20 gives information on kinds of beverages and foods that are high in added sugars and low in essential

nutrients. This list is based on CSFII 1994–1996 food consumption data and contains those foods that contribute about 68 percent of the total added sugars intake in the United States (USDA, Center for Nutrition Policy and Promotion. Unpublished analysis of CSFII 1994-96 intake data, 1999)

Box 21: Names for Added Sugars That Appear on Food Labels

This is a slightly expanded version of former box 12.

Choose and Prepare Foods with Less Salt

Background Information

The Debate. Although most diet and health issues are subject to some ongoing debate, an unusually high level of controversy surrounds recommendations for population-wide dietary salt reduction (Alderman et al., 1997; Gibbs et al., 1997; McCarron 1998; Oparil, 1997; Taubes, 1998; deWardener 1999).

A recent document, which was signed by 16 prominent scientists from North America and Europe, addressed this debate and called attention to new scientific evidence that raised questions about the sodium-hypertension relationship and the basis for the sodium health claims allowed by the Food and Drug Administration on food labels (Alderman et al., 1997). On the other hand, consensus reports supportive of population-wide sodium reduction as a measure for hypertension prevention and control were published by the National High Blood Pressure Education Program of the NHLBI (JNC VI, 1997) and the American Heart Association (Kotchen and McCarron, 1998).

The debate about salt reduction also was featured in a widely publicized article “The (Political) Science of Salt” in *Science* (Taubes, 1998). This article reviewed the wide range of views on the topic overall and the completely divergent interpretations often given to the same evidence.

Sodium and Blood Pressure. The general role of sodium in blood pressure regulation and a role for sodium reduction in the control of established hypertension are not debated. Rather, the debate centers around whether sodium reduction is warranted in the general population. That is, does it apply to people who do not have established hypertension and who might not be genetically at risk for developing hypertension? Arguments against population-wide sodium reduction tend to be based on (1) estimates that a relatively low proportion of the population is sensitive to the blood pressure-raising effects of high sodium intake and (2) the observation that the effects of sodium reduction on the blood pressure of normotensive individuals are small in comparison with the effects of weight reduction. Some consider the effects too small to offset the presumed burden

that a population-wide sodium reduction effort would cause for consumers and industry.

In contrast, those who favor sodium reduction point out that high blood pressure is a multifactorial condition for which susceptibility (i.e., salt-sensitivity) is probably not an “either-or” situation. In any case, if discrete salt-sensitivity does exist in human populations, a means of identifying salt-sensitive individuals in the population at large would be necessary to make it feasible to target recommendations for reduced sodium intake to those who are salt-sensitive (Cowley, 1997; Luft and Weinberger, 1997). In addition, it is not clear whether sodium intake should be singled out in this respect. Differential sensitivity in response may apply to other dietary changes as well, e.g., blood cholesterol response to reduction of dietary saturated fat. Yet, there has been wide support for population-wide dietary recommendations to lower cholesterol.

Several lines of evidence relate sodium intake to blood pressure: results from animal experiments, clinical studies, international comparisons, and population-based trials. Experimental and epidemiological studies of mechanisms and genetic factors continue (Oparil, 1997). Recent studies judged most relevant to the recent debate on sodium recommendations include an intervention study of the effects of moderate sodium reduction on blood pressure of individuals without established hypertension (TOHP Collaborative Research Group, 1997) and meta-analyses synthesizing relevant randomized trials (Cutler and Follmann, 1997; Graudal et al., 1998; Midgely et al., 1996).

The Trials of Hypertension Prevention, Phase II (TOHP-II), evaluated the efficacy of sodium reduction—either alone or in combination with weight reduction—as a strategy for controlling blood pressure and preventing hypertension over a 3- to 4-year period in normotensive overweight men and women who were ages 30–54 at the time of enrollment (TOHP Collaborative Research Group, 1997). Although the reductions observed in blood pressure and hypertension incidence are both small, they support clear inferences because they occurred under the rigorous conditions of a randomized, controlled trial designed specifically to address the question of how sodium reduction affects blood pressure. A limitation of TOHP-II is the relatively short follow up, i.e., 3 to 4 years. Therefore, health outcomes such as coronary heart disease, stroke, and total mortality, which occur relatively infrequently among healthy young adults over the short term, cannot be studied.

Some findings from TOHP-II may relate to sodium sensitivity in the population at large (Hunt et al., 1998, 1999). An analysis stratified by angiotensinogen (AGT) genotype in TOHP II participants identified a subgroup (AA) with a significantly greater predisposition to developing hypertension during the 3-year study period in the absence of intervention (usual care) but with a significantly greater reduction in hypertension after sodium reduction. For

example, response to the sodium intervention was significant in those with the AA genotype (relative risk of 3-year incidence, when compared with usual care, was 0.57 [0.34,0.98]). In those with GG genotype, the risk of developing hypertension was not significantly different in the sodium reduction and usual care groups (relative risk 1.2 [0.79,1.81]). However, the relevance of this analysis to the specific question of sodium-sensitivity in the general population is complicated: the same effect (i.e., better response in AA than in GG) was also observed in the weight reduction arm of the study, in which no sodium reduction occurred. Also, the AA and GG contrast was only relevant to Caucasian participants because of the very low frequency (3 percent) of the GG genotype in the African-American participants.

In general, three recent meta-analyses all support the conclusion that sodium reduction lowers the blood pressure of people with hypertension (Cutler and Follmann, 1997; Graudal et al., 1998; Midgely et al., 1996). They also all indicate that, on average, the effect of sodium reduction on blood pressure is relatively small in people with normal blood pressure. Two analyses (Graudal et al., 1998; Midgely et al., 1996) find no significant effect on blood pressure in normotensive individuals, while Cutler and Follmann (1997) do find a statistically significant blood pressure lowering effect of moderate sodium reduction in normotensives.

The inconsistency in the size and statistical significance of findings from these meta-analyses most likely results from several design and methodologic differences among the analyses. Each of the analyses included different sets of trials (short-term and long-term, laboratory-based and population-based, parallel and crossover designs, double and single blind), covered different age ranges and durations, and examined different attempted and achieved levels of sodium reduction. The investigators also analyzed the data in different ways and came to different conclusions—in spite of considerable overlap in the studies included and in some results (Graudal et al., 1998).

The proposition that weight reduction would preclude the need for a population-wide approach to sodium reduction is countered by pointing out that not all individuals who will develop hypertension are overweight. Furthermore, for those who are overweight, both sodium reduction and weight reduction may be beneficial (TOHP Collaborative Research Group, 1997; Whelton et al., 1998).

Also in favor of population-wide approaches to sodium reduction is the high proportion of U.S. adults who will eventually develop hypertension. Although the overall prevalence of hypertension in U.S. adults over ages 18 or 20 is about 25 percent, it is higher in the middle and older age ranges (Burt et al., 1995). According to 1988–1991 NHANES data, hypertension prevalence (defined as systolic blood pressure/diastolic blood pressure 140 or 90 mm Hg

or under treatment for hypertension) in the age range of 50–79 years was 42 to 61 percent for men and 39 to 68 percent for women. For African Americans, 60 to 68 percent of men have hypertension at ages 50–79 years, and 48 to 73 percent of women do (LSRO, 1995).

Cook and colleagues (1995) estimate that a 2 mm Hg-reduction in the mean diastolic blood pressure of the general population would reduce hypertension prevalence by 17 percent, the risk of coronary heart disease by 6 percent, and the risk of strokes and transient ischemic attacks by 15 percent—over and above the effects targeted by medical interventions in those with hypertension. However, some scientists suggest that speculative estimates of mortality reduction from sodium reduction are not a sound basis for making policy, because such estimates require the assumption that reductions in blood pressure automatically translate into reductions in cardiovascular events and deaths.

It has also been suggested that sodium reduction is no longer needed as a population-wide strategy given the published results of the Dietary Approaches to Stop Hypertension Study (DASH) (Appel et al., 1997; McCarron, 1998). The dietary patterns found effective for blood pressure lowering in this controlled 8-week feeding study were high in fruits and vegetables and low-fat dairy products, and one was reduced in fat—consistent with the 1995 Dietary Guidelines for Americans in many respects. However, sodium intake, weight, and alcohol intake were held constant to examine the potential effects of other dietary factors. The DASH-Sodium study, which was designed to address the issue of the effects of the DASH eating pattern in the context of three reduced levels of sodium—approximately 1150, 2300, and 3500 mg per day—is underway (Svetkey et al., 1999), but results were not available to the committee.

Guideline

The committee suggests that the wording “Choose and prepare foods with less salt,” replace the former “Choose a diet moderate in salt and sodium.” The intent of the guideline is unchanged from the 1995 guideline in emphasizing food sources of sodium rather than salt added at the table as the primary source of dietary sodium intake and in encouraging lower salt intake. The new wording is framed in terms of choosing *foods* rather than *a diet* to convey a clearer meaning from a behavioral perspective and to avoid the erroneous interpretation that the guideline refers to either prescribed “special diets” or to weight reduction diets. Reference to food preparation, i.e., “choose and prepare foods” was added to highlight the particular importance of food preparation practices in determining the sodium content of foods. “Less” is substituted for “moderate” because of its apparent greater clarity for consumers who find the term “moderate” difficult to interpret. “Sodium” is

dropped from the guideline for simplicity; salt is the more familiar term.

Overview

Most of the proposed changes in the text of this guideline are intended to clarify the reasons for the guideline and ways to implement it. In addition, the recommended text gives more emphasis to the way in which dietary and lifestyle factors other than sodium intake influence blood pressure; and it addresses several potential concerns about the safety of lowering sodium intake. The committee suggests that the word "salt" replace "sodium," when applicable (e.g., not when distinguishing between the two or referring to the Nutrition Facts Label).

Introductory Paragraphs

The first sentence in this section now highlights and personalizes the concept of potentially reducing one's risk of high blood pressure by consuming less salt. The suggested revisions more accurately describe the relationship between salt intake and blood pressure. Substantial additional evidence was identified to support the retention of the statement about the effect of salt intake on calcium excretion and to link high sodium intake to the potential acceleration of bone loss (Dawson-Hughes et al., 1996; IOM, 1997; Massey and Whiting, 1995; Matkovic et al., 1995).

The end of the second paragraph in the introduction has been revised to extend the recommendation for sodium reduction to the "normal healthy person" rather than "...adult", in order not to exclude children. This is based on the observation that sodium intakes of U.S. children are high in relation to physiologic needs.

Salt Is Found Mainly in Processed and Prepared Foods

Analyses of dietary intake data from USDA surveys indicate that consumers continue to obtain most of their dietary sodium from salt that has been added to commercial foods in processing (Cleveland et al., 1993; Subar et al., 1998).

Aim for a Moderate Sodium Intake

Recommendations to reduce sodium intake presume that a substantial percentage of Americans have sodium intakes that are relatively high in relation to physiologic needs and recommended intake levels. The proposed text anchors physiologic need by referring to the amount of salt (1/4 tsp) that provides the estimated minimum level of 500 mg of sodium per day (NRC, 1989). Like the 1995 guideline, the revised text refers to the 2400 mg Daily Value on the Nutrition Facts food label.

The best available estimates of total sodium intake in the U.S. population are from national survey data based on 24-

hour recall interviews conducted as part of NHANES III. Considering the sodium from foods, dietary supplements, tap water, and salt use at the table, and adjusting for day-to-day variation in intake, approximately 79 percent of people ages 2 years and over consumed more than the 2400 mg Daily Value of sodium between 1988–1994 (U.S. DHHS, 1998). Because sodium intake varies with energy intake, there is considerable age and sex variation in the likelihood of exceeding the Daily Value. For example, this level of sodium intake was exceeded by 50 percent of boys ages 2–5 years, 95 percent of males ages 12–19 years, and 70 percent of females ages 20 and over. Average sodium intake of the overweight 30- to 54-year-old men and women in TOHP II was 4200 mg per day, estimated from 24-hour urine samples collected at baseline (TOHP Collaborative Research Group, 1997). NHANES III data suggest that sodium intake increased between 1971–74 and 1988–1991, but this could be an artifact of changes in the dietary assessment methodology (LSRO, 1995).

Evidence about the association of sodium intake and blood pressure does not indicate a threshold of sodium intake above which no benefit can be achieved by sodium reduction. Thus, moderate sodium reduction may be beneficial across a range of sodium intake. The committee considered whether to specify a recommended upper limit of sodium intake—that is, to go beyond the indirect reference to the 2400 Daily Value for sodium on the Nutrition Facts Label. However, it did not find a sufficient basis for doing so. No evidence was identified relevant to the issue of setting a lower limit for sodium intake in the general population, although this was of interest in relation to safety.

Advice for Today

The proposed text now mentions fruits as an additional way to flavor foods without salt. Specific advice about choosing restaurant and fast foods has also been added. A statement about the sodium content of food groups in the Food Guide Pyramid was deleted because specific relevant advice now appears in Box 25.

Box 22: Steps That May Help Keep Blood Pressure in a Healthy Range

This box provides an integrated listing of current dietary and lifestyle change advice related to blood pressure (JNC VI, 1997; National High Blood Pressure Education Program, 1997). Given that the primary focus of this guideline relates to advice about sodium intake, the committee did not directly review the general literature on non-pharmacologic approaches to blood pressure lowering. However, results of the three relevant large-scale trials published since 1995 are supportive of the advice in this box (Appel et al., 1997; TOHP Collaborative Research Group, 1997; Whelton et al., 1998)

Box 23: Is Lowering Salt Intake Safe?

The committee suggests adding a box on this topic primarily to indicate that special circumstances (e.g., illness, initiation of vigorous exercise) might warrant caution.

The committee did not identify evidence supporting concerns about the safety of moderate sodium reduction as such. Kumanyika and Cutler (1997) published a comprehensive review on possible adverse effects of moderate sodium reduction. They concluded that, although the issues have not been studied directly, none of the available evidence raised any reason for concern about the safety of current dietary guidance to reduce sodium to moderate levels in the general population. Because of the publicity given to studies on the question of sodium intake and heart disease incidence or mortality (Taubes 1998), the committee did examine several relevant studies (Alderman et al., 1995, 1997, 1998; Tunstall-Pedoe, 1997). However, the conclusions from these studies were inconsistent and weakened by flawed or imprecise measurement of sodium intake. The most recent analysis of this question supports recommendations for sodium reduction to moderate levels, perhaps particularly in overweight men and women. That is, in the NHANES I Epidemiologic Follow-Up Study, high sodium intakes at baseline were associated with an increased risk of both cardiovascular disease and all-cause mortality, over an average of 19 years of follow up, in overweight persons (BMI 27.3 for women, 27.8 for men). No association of sodium intakes with cardiovascular disease risk was observed in those who were not overweight (He et al., 1999).

The effect of reductions in table salt use on iodine nutriture was considered at length because table salt is currently used as the vehicle for iodine fortification. Iodine deficiency, if present for even a small percent of the U.S. population, would constitute a serious public health problem (LSRO 1995; NCEH, 1998). To date, no published evidence could be found that this is a problem.

Concern about iodine intake with salt reduction is new, in part because at the time that sodium reduction guidelines were first introduced, the levels of iodine contamination in the U.S. food supply were considered excessive (Park et al., 1981). No data were identified on consumption patterns for iodized table salt and the iodine status of those who consume it. Hence, there is currently no basis for determining whether and for whom advice to reduce the use of table salt would compromise iodine status. A conflict in dietary guidance policy would arise if advice to increase the consumption of iodized salt were to be deemed necessary while advice to reduce table salt intake was extant. The statement about iodized table salt was included to be sensitive to this potential conflict.

Box 24. Salt Versus Sodium

The committee suggests adding this box to help consumers understand the relationship between the two terms and to aid in interpreting food labels.

Box 25. Ways to Decrease Your Salt Intake

Apart from the title, the major suggested revisions to former box 15 are in the organization and clarity of the content. The suggested emphasis on foods from eating establishments was based on evidence that food eaten away from home is contributing an increasing amount to Americans' sodium intake (Lin et al., 1999).

If You Drink Alcoholic Beverages, Do So in Moderation

Guideline

The committee concurs with the 1995 wording of this guideline. Revisions of the text are for purposes of placing more emphasis on adverse effects of excess intake and updating statements based on more current scientific evidence.

Introductory Paragraphs

The proposed text now begins with a paragraph that addresses adverse effects of excess alcohol intakes and mentions no beneficial effects. The second paragraph gives the age groups for whom moderate drinking may reduce risk of coronary heart disease and makes it clear that younger groups are unlikely to benefit. This greater specificity is based on the age- and sex-specific rates of coronary disease (NCHS, 1999) and on the age-specific relative risks related to moderate alcohol consumption obtained from detailed prospective data from three very large cohorts of men and women in the United States (Fuchs et al., 1995; Rimm et al., 1991; Thun et al., 1997).

In the list of health risks associated with alcohol intake, "certain cancers" has been changed to add "breast cancer." A recently published pooled analysis (Smith-Warner et al., 1996) shows an increased risk of breast cancer of approximately 9 percent for an increment of 10 g of alcohol/day—a risk that is relatively small but of great concern to some women. The committee suggests adding the caution that risk of alcohol abuse increases with early age at initiation of drinking (Grant and Dawson, 1997; Prescott et al., 1999).

The committee suggests that the sentence in the previous guideline "Alcoholic beverages have been used to enhance the enjoyment of meals by many societies throughout human history" be omitted from the current text. Although that statement is factually correct, a similar statement could be made for many other foods and nutrients, for example, salt or sugar. The committee recognizes the intent of the

earlier committee to place moderate alcohol consumption in the context of a healthy diet. However, the particular sentence is inconsistent with the text in the other guidelines and is therefore omitted.

Box 26: "What Is Drinking in Moderation?"

A sentence has been added to this box to make it clear that the different limits for men and women are based on both metabolism and body size.

Who Should Not Drink?

This section has been changed to be more specific about categories of individuals who should not drink. The bullet pertaining to pregnancy has been strengthened: (1) The phrase "women who may become pregnant" replaces "women who are trying to conceive to reflect the many completed U.S. pregnancies that are unplanned (Brown and Eisenberg, 1995; U.S. DHHS, 1999). Because fetal alcohol syndrome is a well-recognized clinical entity (Jacobson et al., 1994), the text now indicates that major birth defects can be caused by heavy drinking by the pregnant woman; this replaces the phrase that birth defects "have been attributed to heavy drinking." The change is further supported by several recent studies, both clinical (Holtzman et al., 1995; Sowell et al., 1996) and mechanistic (Cartwright and Smith,

1995a,b; Chen and Sulik, 1996). The phrase "While there is no conclusive evidence that an occasional drink is harmful to the fetus or to the pregnant woman" has been deleted. Although the phrase is scientifically correct, it weakens the message; and survey data show that young women tend to underestimate the adverse effects of drinking alcohol during pregnancy (Cornelius et al., 1997; Ebrahim et al., 1999; Mackinnon et al., 1995). In addition, the phrase "including the first few weeks" has been added to make it clearer that adverse effects may begin before the woman knows she is pregnant. The phrase "operate machinery" has been added as a second example of activities requiring attention or skill. The bullet concerning medications has been changed to be less restrictive. Including all prescription and over-the-counter medications, as was done in the 1995 Dietary Guidelines, is a sweeping statement that is not supported by scientific evidence. The bullet has been modified to indicate that certain medications can interact with alcohol and to advise those who take medications to ask their health care professional for guidance.

Advice for Today

The text has been expanded to provide greater specificity with regard to the meaning of moderation and to not drinking before or when driving.

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Recommendations

The Dietary Guidelines serve as the principal federal policy document related to making dietary choices. This policy document is intended to serve the public in at least five ways: (1) to assist consumers in making dietary choices most likely to promote their well-being and avoid or postpone the onset of diet-related chronic diseases; (2) to assist federal, state, and local agencies in the development of policies to guide the implementation of feeding and educational programs; (3) to assist agencies at the state and local levels in the formulation and implementation of regulatory policies and programs that relate to food, nutrition, and health; (4) to assist health care providers in primary disease prevention efforts; and (5) to guide other domestic and international for-profit and non-profit organizations in the implementation of food, nutrition, and health goals.

In recognition of the important roles of these guidelines, Congress mandates their review every 5 years. This mandate provides the basis for the timely revision of the guidelines, the identification of potential improvements in the review process itself, and the prioritization of information gaps that are uncovered by the process. This section of the report of the Dietary Guidelines Advisory Committee focuses on the latter two objectives. The committee's recommendations (see bullets below) are organized into two general areas: improving the review process and filling information gaps.

Improving the Review Process

- Provide more information about specific users and uses of the Dietary Guidelines to help inform future Dietary Guidelines Advisory Committees about how best to approach the development of specific guidelines.

There is increasing controversy as to the principal uses of the Dietary Guidelines. In particular, do they serve primarily as a consumer educational tool or as a policy guide for various federal, state, and local programs; or do they serve both of these purposes? These fundamentally different purposes demand substantially different approaches to the revision of the Dietary Guidelines and documentation of the basis for the revisions.

- Improve ways of integrating communication expertise into the Dietary Guidelines Advisory Committee process.

Dietary Guidelines Advisory Committee members are typically not consumer experts. Neither are they experts in the qualitative methods required to design educational materials that effectively communicate desired messages. If

advice from relevant experts of this type were available more readily, debate over the wording of messages would be more informed, and the text for the final consumer booklet likely would be improved.

- **Improve definition of the interrelationship between the Food Guide Pyramid and the Dietary Guidelines.**

If the Dietary Guidelines should include guidance on choosing a nutritionally adequate diet, and the Food Guide Pyramid is the consumer tool for accomplishing this, it will be helpful to include the Food Guide Pyramid in the Dietary Guidelines. Thus the processes and mutual responsibilities for articulating appropriate revisions of both educational tools should be improved. Moreover, both of these activities need to consider harmonization with Nutrition Facts on the food label.

Filling Information Gaps

Information gaps generally fall into three broad categories. The first focuses on relationships among specific foods, food components, and/or food-related practices and health outcomes of interest. The second centers on monitoring the effectiveness of the Dietary Guidelines and of activities designed to implement them for purposes of promoting well-being and primary prevention. The third addresses educational tools designed to improve the implementation of the Dietary Guidelines.

Diet and Health Outcomes

- **Conduct prospective studies to evaluate short- and long-term benefits of adherence to the Dietary Guidelines, both as a coherent body of advice and also as specific guidelines.**

Although health benefits are expected from the implementation of the Dietary Guidelines, research testing this expectation has been limited both in quality and quantity. Addressing this recommendation would require the development of prospective methods to assess the implementation of recommended dietary patterns and changes in eating patterns over time. Ideally, it would also involve the development of biomarkers of early stages of diet-related chronic disorders that the guidelines are designed to prevent or postpone.

The committee recommends incorporating "variety" in the wording of two guidelines, but research is needed on the health consequences of variety, or the lack thereof, between and within food groups. In addition, associations among variety, energy intake, nutrient adequacy, and health outcomes should be evaluated thoroughly.

- **Improve our understanding of overweight and obesity, health risks related to obesity and overweight, and risks and benefits of their treatment.**

An enhanced database would allow better assessment of associations between obesity or overweight and health risks in specific age, gender, racial, and ethnic groups. Similarly, an improved understanding is needed of the risks and benefits associated with weight loss in those groups, especially the extent to which sustained reductions in body weight by obese persons can improve their long term morbidity and mortality. Also of interest are the roles of physical activity, food portion sizes, energy density of the diet, and specific dietary components (e.g., fat and added sugars) in the development of obesity and its treatment.

- **Conduct population studies to assess health outcomes related to the intake of different levels, types, and sources of dietary carbohydrates.**

Of all the databases related to specific nutrient groups, the database related to carbohydrate intake was among the most troublesome and deficient. Using USDA nationwide food consumption survey data, for example, a negative association was demonstrated between the intakes of beverages and foods high in added sugars and intakes of more nutrient-rich beverages. However, it was clear that there is no consensus of the best statistical methods for analyzing food consumption data to identify nutrient displacement issues.

Another principal problem that relates to this specific recommendation is that there is substantial disagreement on how "added sugars" and "total sugars" are defined and whether it is useful to distinguish between the two. Hence, the Continuing Survey of Food Intake by Individuals and the National Health and Nutrition Examination Survey should report intakes of both total and added sugars, using consistent, well-justified definitions.

Similarly, although a link is suspected between added or total sugars intake and body fatness, this association has not been demonstrated consistently. It is hypothesized that the putative association is masked by the persistent and pervasive problem of underreporting of food intake, the extent of which tends to differ with weight status. Additionally, foods high in added sugars are known to be underreported to a greater degree than are other foods. Research is needed to test more effectively the association between intake of sugars (both total and added) and BMI.

Much controversy was encountered related to the health consequences of diets characterized by a high glycemic index or load. Additional research is needed to evaluate their health impact.

Finally, much public input was received regarding the potentially adverse consequences of dairy product consumption for subpopulations with a high prevalence of lactose intolerance, lactose maldigestion, or both. Although these conditions may be caused by intestinal pathology, members of many ethnic groups in the United States have one or both conditions as a result of normal developmental decreases in intestinal lactase. Additional research is needed to explore the nature of the adverse effects and the apparent discrepancies between the bulk of the scientific literature and the public perception of the consequences of normally low levels of intestinal lactase.

- **Determine the optimal ratios between fat and carbohydrate for the American diet.**

Many important nutritional issues revolve about the question of the optimal ratio of fat to carbohydrate in the diet. This ratio may have an impact on body weight, dyslipidemia, insulin resistance and the metabolic syndrome, and risk for cancer.

- **Determine the optimal fatty acid composition of the diet.**

There is a need to investigate optimal ratios of saturated-to-monounsaturated-to-polyunsaturated fats, including ratios of omega-6 to omega-3 fatty acids. The potential for omega-3 polyunsaturated fat to reduce the risks for cardiovascular diseases and cancer deserves particular attention. The specific influences of the different fatty acids on many metabolic processes are poorly understood.

- **Evaluate the role of the Dietary Guidelines in promoting improved calcium status among at-risk populations.**

Repeated concerns were expressed about the role of the Dietary Guidelines in improving health outcomes related to calcium intake. Among the topics that received most attention were (1) relationships between various levels of calcium intake and health outcomes, (2) the impact of diet composition on calcium utilization, (3) the putative replacement of beverages that are rich in calcium by beverages that are low in calcium and high in added sugars, and (4) the role of non-dairy foods as a source of calcium. The committee recommends determination of the impact on overall nutrient adequacy and bone health of substituting high-calcium nondairy foods for high-calcium dairy foods.

Some committee members expressed concern that dairy foods may be serving as a surrogate marker for a "healthy" diet and a "healthy" lifestyle. Future studies should consider the potential bone protective effects of the higher fruit and vegetable intakes and lower carbonated beverage intakes characteristic of many dairy users. Furthermore,

some committee members identified a need to evaluate the effects of the nutrient composition of various dairy foods on urinary calcium loss and skeletal mass, especially among diverse racial and ethnic groups.

There was a lack of useful data to determine whether limiting the intake of beverages and foods high in added sugars would increase the consumption of more nutrient-rich beverages and foods, particularly those of high calcium content. For example, if children drink fewer soft drinks, will that necessarily result in increased milk consumption?

- **Develop improved, easy-to-use tools to measure physical activity, and improved measures of health benefits and risks of combined nutrition and physical activity interventions, especially for routine daily activities.**

Improved information of this type would enhance the basis for exploring the impact of an increasingly sedentary lifestyle and for setting age-, physiologic state-, and gender-specific norms or performance goals. Such goals can provide feedback to persons about their physical activity level and information to policy makers related to their effectiveness.

- **Investigate further the health benefits (and risks) of combined nutrition and physical activity interventions.**

For example, the committee found insufficient information related to the complementary aspects of strength training, aerobic activities, and nutrition-based interventions designed to promote improved physical abilities and cardiovascular health.

- **Explore potential mechanisms that account for the decreased risks of chronic or degenerative diseases that are attributable to whole grain and to fruit and vegetable intakes.**

Understanding is very limited of the biological mechanisms that account for the consistent associations between intakes of whole grains, fruits, and/or vegetables and the risk of selected diet-related chronic diseases. Such information could affect the selection of appropriate species and strains of various grain, fruit, and vegetable crops; shape the advice given to consumers; and lead to improvements in health.

Related to this recommendation is the need to develop a comprehensive database on phytochemicals and other constituents of specific fruits and vegetables. This type of database would improve our understanding of the biodiversity of our food supply and of food-related factors responsible for improved health outcomes.

- **Conduct studies on the appropriateness of population-wide recommendations related to sodium intake.**

Metabolic studies, population-based intervention trials, and surveys are needed to help resolve the continuing and often contentious debate on population-wide recommendations concerning sodium intake. Questions were raised concerning the need for such recommendations, the range of intake that should be recommended, and the feasibility and safety of such recommendations. Of particular interest was the impact of population-wide recommendations in the face of the variable blood pressure response of individuals to lowered sodium intakes.

It is likely that the relationship of sodium intake and hypertension will continue to be the primary health issue driving sodium reduction policy. However, it is apparent that the effect of sodium intake on blood pressure levels is becoming less acceptable as a proxy for effects on cardiovascular disease as such, particularly cardiovascular mortality. Since trials on mortality endpoints are no longer considered feasible and are unlikely to be undertaken, studies are needed that will link sodium reduction to cardiovascular morbidity. Also, since some nutrition experts are unwilling to conclude that population-wide sodium reduction is safe, population-based studies are needed to evaluate the potential adverse effects of moderate sodium reduction. Studies are also needed to clarify the relevance of children's sodium intakes to their long-term health status. In addition, studies are needed of the effects of selected anions and cations (e.g., chloride and potassium) on blood pressure.

Four additional health problems were identified that appeared to be linked with high sodium intake: osteoporosis; renal stones; asthma; and gastric cancer. In the case of osteoporosis, for which the evidence is strongest, clarification is needed of the circumstances (e.g., age, physiologic status) under which sodium intake influences calcium deposition in and mobilization from bone to maintain normal circulating levels of calcium. Other research questions are whether excessive sodium intakes predispose healthy individuals to renal stones and gastric cancer or aggravate asthma in affected individuals.

- **Improve our understanding of the risks and benefits of moderate levels of alcohol consumption in relevant age groups.**

The adverse health effects of excess alcohol consumption are well documented. However, mounting scientific evidence supports a beneficial effect of moderate alcohol consumption that is, a significant reduction in the risk of coronary disease in adults whose age places them at risk for this condition. Further research is needed to explore the mechanisms that underlie this protective effect. Additional research would also be useful on relationships between moderate alcohol consumption and gall bladder disease and type 2 diabetes, conditions for which limited data suggest a benefit.

Although the magnitude of the reported association between moderate alcohol consumption and coronary disease may merit a randomized clinical trial, more data are needed to quantify the potential hazards of requiring moderate alcohol intake in a trial and/or of recommending moderate alcohol consumption to nondrinkers. Additionally, research is needed on the determinants of alcoholism and other forms of problem drinking.

Monitoring

- Continue to monitor dietary intakes and health outcomes.

If efforts to curb tobacco use succeed, the proportion of preventable morbidity and mortality due to inappropriate diets and physical activity patterns will increase. Monitoring systems linked to appropriate decision making levels (i.e., community, state, regional, and national) will be required to identify the best strategies to minimize health disparities and preventable mortality and morbidity in all population groups.

Nutrition monitoring research also is needed to clarify how best to measure specific dietary components. One example of this is the development of measures of sodium intake that are feasible for surveys and effective in estimating total sodium intake in people with different patterns of sodium consumption.

- Monitor the health outcomes and effectiveness of school physical education classes and community programs designed to engage children, adolescents, and adults in physical activity.

The Committee was alarmed at the continuing decreases in the opportunities for children and adolescents to engage in physical activities through school physical education classes and other community programs. Information reviewed by the committee argues strongly for increasing the number of programs designed to enhance physical activity and for monitoring outcomes as a means of improving program effectiveness.

- Improve methods and systems for monitoring the incidence of foodborne illnesses, especially methods and systems that would be applicable at the household level.

Underreporting of foodborne illnesses experienced by consumers in the home appears to be common. The definition of a foodborne disease outbreak currently requires only two or more cases. More research is necessary to develop means for detecting and reporting single-case outbreaks, especially those that occur in the home and among vulnerable, high-risk populations. Improvements in methods and systems also are essential to determine the effectiveness of food safety advice in altering related consumer behaviors.

Design of Educational Tools

- Take steps to harmonize the information on the Nutrition Facts Label with the Food Guide Pyramid, particularly with respect to serving sizes and energy levels.

The serving sizes used in the Nutrition Facts Label and the Food Guide Pyramid differ greatly for some foods, potentially leading to consumer confusion. In addition, the relationship between servings sizes included in these educational tools and usual portions should be documented better.

It would be helpful to consumers if the energy levels shown for the Food Guide Pyramid (1600, 2200, and 2800) corresponded with the energy levels used for the Daily Values on the Nutrition Facts Labels (2000 and 2500). These differences cause substantial consumer confusion and make it difficult to integrate the Food Guide Pyramid and the Nutrition Facts Label into meaningful guidance for the public.

- Conduct intervention studies to guide the development of strategies, educational tools, and programs designed to help change dietary patterns at the individual and population levels.

The effectiveness of educational tools and of programs that are designed for the implementation of Dietary Guidelines should be tested in appropriately designed interventions. For example, there is an expectation that splitting the 1995 grains/fruit and vegetable guideline into two separate guidelines will result in a more effective educational tool and lead to an increased intake of a variety of these foods, especially whole grains and fruits.

A second example is the expectation that using food thermometers will decrease the incidence of foodborne illness from undercooked animal foods prepared at home. The evidence base for this assertion should be improved, especially for high-risk foods. Similarly, studies are needed of the actual risks and benefits derived from the use of food thermometers.

- Revise the "Food Guide Pyramid" to incorporate all elements of the Dietary Guidelines proposed in this report.

The promotion and uses of the Food Guide Pyramid led to the committee's interest in evaluating the feasibility of incorporating all 10 recommended guidelines in an effective Food Guide Pyramid graphic. The committee urges the development and use of graphics that encourage low-fat choices from the meat and dairy groups, the consumption of

whole grain foods, and physical activity. The committee expressed special enthusiasm for the development of a physical fitness pyramid graphic to be included in the Dietary Guidelines booklet.

- **Investigate what motivates people, on an individual and societal level, to adopt recommended behaviors, such as engaging in physical activity, making healthy food choices, and improving food safety.**

The number of persons in the United States who engage in regular physical activity is less than the proposed *Healthy People 2010* goals. Our understanding is incomplete of the influences of the technical revolution on physical activity. For example, what is the combined effect of having multiple remote control devices at our ready disposal, and of other factors that influence the amount of routine and work-related physical activity undertaken? Improving this understanding is expected to provide improved tools for promoting physical activity goals.

An example of the need to study the adoption of recommended food choice behaviors relates to sodium intake. Consumer research is needed to identify attitudes and behaviors that affect dietary sodium intake. Such information could be used to improve both food industry and consumer education approaches to sodium reduction. Research topics might include perceptions of the importance of salty flavor in various foods or types of food; the priority given to sodium content, calorie content, fat content, convenience, and nutrition value when selecting various

types of foods; consumers' knowledge of sources of salt in their usual eating patterns; the ability of consumers to discern salt content from food labels (e.g., awareness that an item like "garlic pepper" may be primarily table salt); consumers' attitudes towards eating unsalted catered and restaurant foods; their attitudes towards the wholesomeness of foods from which salt-containing preservatives have been omitted; and their interest in or willingness to reduce salt intake under different assumptions about the ease of accomplishing this. Stratification of consumers on age, income, and perceived susceptibility to hypertension (e.g., based on family history) would be important for such research. Similar approaches would apply to behaviors recommended for other guidelines.

- **To evaluate methods for educating the public on how to differentiate between different kinds of fat.**

With the increased emphasis on reducing saturated fat, methods need to be developed to educate the public to recognize foods that are high in saturated fat. New research needs to be sponsored to develop and evaluate methods to achieve this aim.

Appendix I: **Background**

History Of Dietary Guidelines For Americans

The *Dietary Guidelines for Americans*, developed jointly by the Departments of Health and Human Services (HHS) and Agriculture (USDA), provide recommendations based on current scientific knowledge about how dietary intake may reduce risk for major chronic diseases and how a healthful diet may improve nutrition. The guidelines form the basis of Federal food, nutrition education, and information programs. First published in 1980, Dietary Guidelines were revised in 1985, 1990, and 1995. Public Law 101-445, Section 3 requires publication of the *Dietary Guidelines* at least every five years (1). This legislation also requires review by the Secretaries of USDA and HHS of all Federal dietary guidance-related publications for the general public (1). The fifth edition of the *Dietary Guidelines for Americans* is scheduled for release in 2000.

Development of the Dietary Guidelines — a Chronology

1977 *Dietary Goals for the United States* (the McGovern Report) was issued by the U.S. Senate Select Committee on Nutrition and Human Needs (2). These goals were the focus of controversy among some nutritionists and others concerned with food, nutrition, and health.

1979 American Society for Clinical Nutrition (ASCN) formed a panel to study the relation between dietary practices and health outcomes (3). The findings, presented in 1979, were reflected in *Healthy People: the Surgeon General's Report on Health Promotion and Disease Prevention* (4).

1980 *Nutrition and Your Health: Dietary Guidelines for Americans*, first edition, was issued jointly by HHS and USDA in response to the public's desire for authoritative, consistent guidelines on diet and health (5). The *Guidelines* were based on the most up-to-date information available at the time and were directed to healthy Americans. These Guidelines generated considerable discussion by nutrition scientists, consumer groups, the food industry and others.

1980 A U.S. Senate Committee on Appropriations report directed that a committee be established to review scientific evidence and recommend revisions to the *Dietary Guidelines* (6).

1983-84 A Federal Advisory Committee of nine nutrition scientists selected from outside the Federal Government was convened to review and make recommendations to HHS and USDA about the first edition of the *Dietary Guidelines* (7).

1985 HHS and USDA jointly issued a second edition of the *Dietary Guidelines* (8). This revised edition was nearly identical to the first. Some changes were made for clarity while others reflected advances in scientific knowledge of the associations between diet and a range of chronic diseases. The second edition received wide acceptance and was used as a framework for consumer education messages.

1987 Language in Conference Report of the House Committee on Appropriations indicated that USDA, in conjunction with HHS, "shall reestablish a Dietary Guidelines Advisory Group on a periodic basis. This Advisory Group will review the scientific data relevant to nutritional guidance and make recommendations on appropriate changes to the Secretaries of the Departments of Agriculture and Health and Human Services (9.)"

1989 USDA and HHS established a second advisory committee that considered whether revision to the 1985 *Dietary Guidelines* was needed, and then proceeded to make recommendations for revision in a report to the Secretaries. The 1988 *Surgeon General's Report on Nutrition and Health* (10) and 1989 National Research Council's report, *Diet and Health: Implications for Reducing Chronic Disease Risk*, were key resources used by the Committee (11).

1990 The National Nutrition Monitoring and Related Research Act (P.L. 101-445) was passed which requires publication of *Dietary Guidelines* every 5 years (1). This legislation also requires review by the Secretaries of USDA and HHS of all Federal publications containing dietary advice for the general public.

1990 HHS and USDA jointly released the third edition of the *Dietary Guidelines* (12). The basic tenets of the *Dietary Guidelines* were reaffirmed, with additional refinements made to reflect increased understanding of the science of nutrition and how best to communicate the science to consumers. The language of the new Guidelines was more positive, oriented toward the total diet, and provided more specific information regarding food selection. For the first time, numerical recommendations were made for intakes of dietary fat and saturated fat.

1993 Charter established the 1995 Dietary Guidelines Advisory Committee.

1994 The 11 member Dietary Guidelines Advisory Committee was appointed by the Secretaries of HHS and USDA to review the third edition of the *Dietary Guidelines for Americans* to determine if changes were needed, and if so, to recommend suggestions for revision along with the rationale for any revisions.

1995 The report of the Dietary Guidelines Advisory Committee to the Secretaries of HHS and USDA was published (13). This report served as the basis for the fourth edition of *Nutrition and Your Health: Dietary Guidelines for Americans*.

1995 USDA and HHS jointly released the fourth edition of the *Dietary Guidelines* (14). This edition continued to support the concepts from earlier editions. New information included the Food Guide Pyramid, Nutrition Facts Labels, and boxes highlighting good food sources of key nutrients. The weight table was replaced with a chart that illustrated three weight ranges. Additional changes were intended to clarify and emphasize key points.

1997 Charter established the 2000 Dietary Guidelines Advisory Committee.

1998 The 11 member Dietary Guidelines Advisory Committee was appointed by the Secretaries of HHS and USDA to review the fourth edition of the *Dietary Guidelines for Americans* to determine if changes are needed, and if so, to recommend suggestions for revision.

2000 The Committee submitted its report to the Secretaries of HHS and USDA. This report will serve as the basis for the fifth edition of *Nutrition and Your Health: Dietary Guidelines for Americans*.

2000 USDA and HHS will jointly issue the fifth edition of the *Dietary Guidelines*. This publication will continue to serve as the basis of Federal nutrition policy and provide advice to consumers about food choices that promote health and decrease the risk of chronic disease.

7. U.S. Department of Agriculture, Human Nutrition Information Service, Dietary Guidelines Advisory Committee. Report of the Dietary Guidelines Advisory Committee on the Dietary Guidelines for Americans, 1985.

8. U.S. Department of Agriculture and U.S. Department of Health and Human Services. *Nutrition and Your Health: Dietary Guideline for Americans*, 2nd ed. Home and Garden Bulletin No. 232, 1985.

9. U.S. House of Representatives Conference Committee, 100th Cong., 1st sess., 1987, H. Rep. 498.

10. U.S. Department of Health and Human Service, Public Health Service. The Surgeon General's Report on Nutrition and Health. DHHS (PHS) Publication No. 88-50215, 1988.

11. National Academy of Sciences, National Research Council, Food and Nutrition Board. *Diet and Health: Implications for Reducing Chronic Disease Risk*. Washington, DC, National Academy Press, 1989.

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14. U.S. Department of Agriculture and U.S. Department of Health and Human Services. *Nutrition and Your Health: Dietary Guideline for Americans*, 4th ed. Home and Garden Bulletin No. 232, 1995.

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1. National Nutrition Monitoring and Related Research Act of 1990, Public Law 445, 101st Cong., 2nd sess. (October 22, 1990), section 301.
2. U.S. Senate Select Committee on Nutrition and Human Needs. *Dietary Goals for the United States*, 2nd ed. Washington, DC, U.S. Government Printing Office, 1977.
3. Task force sponsored by the American Society for Clinical Nutrition. The evidence relating six dietary factors to the nation's health. *American Journal of Clinical Nutrition (Supplement)* 32:2621-2748, 1979.
4. U.S. Department of Health, Education, and Welfare, Public Health Service. *Healthy People: The Surgeon General's Report on Health Promotion and Disease Prevention*. DHEW (PHS) Publication No. 79-55071, 1979.
5. U.S. Department of Agriculture and U.S. Department of Health and Human Services. *Nutrition and Your Health: Dietary Guidelines for Americans*. Home and Garden Bulletin No. 232, 1980.
6. U.S. Senate Agricultural Appropriations Committee, 96th Cong., 1st sess., 1980, S. Rep. 1030.

Appendix II:

Summary of Recommendations from Public Comments

Total Submissions with Recommendations: 165

The Dietary Guidelines Advisory Committee (DGAC) accepted public comments in written form throughout their charter (September 1998 to November 1999). In addition, public comments were presented as oral testimony during the March 8-10, 1999 meeting of the committee. Public comments were received from individuals, interest groups, industry, academia, state and federal government agencies and elected officials. Comments ranged from post cards to portfolios, newspaper clippings to research articles and from original research to focus group testing and surveys. Public input helped the committee gather background information and precedent, understand consumer perception, clarify problems with language, and ensure that important topics were not neglected. The following is an attempt to summarize the specific recommendations made in the written public comments. Note that many submissions included comments on more than one area. Additionally, many submissions contained information for consideration, but not specific recommendations.

General Recommendations

Format:

- Do not use a two-tiered format. (2)
- Consider reducing the number of Guidelines (2).
- Use a tiered format to prioritize the information in the Guidelines (5). There is a “false equity” in the current guidelines structure.
- Change the Dietary Guidelines format to make them more useful to consumers.

Scope:

- Make the Guidelines qualitative rather than quantitative. (3)
- Strengthen current Dietary Guidelines so the public can achieve current pyramid recommendations.
- Avoid guideline recommendations based on specific nutrients or foods.
- Keep the Guidelines firmly grounded in research and reflect advances in scientific understanding in the guidelines. (Numerous)
- Transform the guidelines into health guidelines, including topics such as smoking cessation and exercise.
- Make the Guidelines practical and attainable, in addition to science-based. (2)
- Design the Guidelines to preserve and return the health of all Americans.

- Focus on good diets and not on good and bad foods. (Numerous)
- Focus on foods rather than nutrients. (2)
- Apply the Guidelines to all healthy Americans over the age of 2 years.
- Design the Guidelines to be applicable to all Americans, not just “healthy” Americans who are not overweight, or don’t have other health problems.
- Make the DASH diet the unifying theme of the guidelines.

Content:

General -

- Make the Guidelines more specific about recommendations for intakes of foods. (2)
- Include the Healthy Eating Index (HEI) in the 2000 Dietary Guidelines.
- Add a calcium guideline focused on increasing calcium intakes for better bone health and blood pressure.
- Add protein and soy products as topics within the Guidelines.
- Focus on minerals, such as calcium, iron, and chromium.
- Address the dangers of low-carbohydrate diets.
- Use evidence produced by academic research funded by the Health Education Authority (UK) in the area of healthy eating.

Target Audience -

- Recognize the increasing ethnic and cultural diversity within the US (3). Include foods that are familiar to a wide range of cultures in Guideline discussions.
- Add separate guidelines for children (0 to 18 years).
- Do not issue separate guidelines for children.
- Add advice similar to the American Heart Association’s Dietary Guidelines: “population-wide guidelines do not address the specific needs of all individuals.”
- Develop age-targeted guidelines to reflect the varying needs and priorities of different age groups within the population.
- Be sensitive to the needs of the elderly (2) and emphasize the value of high quality, nutrient dense foods.
- Acknowledge and encourage individualized choices and special needs throughout the lifecycle.

Chronic Disease -

- Address chronic disease in the Guidelines. (2)
- Create multiple sets of guidelines to encompass people with different tendencies toward chronic, diet-related diseases.
- Recommend that, as they age, people reduce food components of their diet linked to chronic diseases.
- Have the Guidelines address the fact that many chronic diseases, particularly hypertension, diabetes, obesity, and prostate cancer, take a disproportionate toll among racial minorities.
- Encourage individuals to reduce their risk of disease by increasing their consumption of vegetables, fruits, whole grains, and legumes, and reducing or eliminating the use of meats, dairy products, and fatty foods.
- Clearly denote desired behaviors that help reduce the risk of osteoporosis.
- Add a list of contacts for people with conditions that require special diets (i.e., diabetes, heart disease, renal disease, diverticulosis, hypertension, lactose intolerance, food allergies).

Food Choices -

- Emphasize that consumers can select healthy foods that taste good, and still meet Dietary Guidelines.
- Incorporate soy into the diet within several of the guidelines.
- Include discussion about the health effects of other beverages (besides alcohol), particularly caffeinated products.
- Address the issues of increased consumption of salt, sugar, and fat from foods eaten outside the home.

Serving/Portion Sizes-

- Strengthen information on serving sizes and portions wherever possible (4), especially regarding restaurant and take-home meals.
- Servings sizes are confusing to consumers, especially for grains, and may be leading to overconsumption.

Enjoyment of Food-

- Establish a new Guideline that celebrates the shared meal, encouraging Americans to prepare and enjoy meals together with family, friends, and colleagues (2).
- Acknowledge the importance of pleasure and emotional satisfaction throughout the Guidelines.
- Apply concepts of taste, flavor, and pleasure of food throughout the Guidelines (2).

Communication:

- Consumer research indicates that the Guidelines could be better communicated to the public. Consumers can't apply the Guidelines to develop an eating pattern.
- Clearly communicate whether the Guidelines are a policy tool or intended for consumers (and make them more consumer-friendly).
- The public needs clear, consistent, and concise messages about how to select foods that will comprise a healthy diet that they can enjoy (2).
- Make the Guidelines easy to understand, manageable, and motivational in order to trigger behavioral change.
- Address environmental supports as well as personal supports for behavior change.
- Design the Guidelines to reach people at various stages of readiness to make a behavioral change.
- The Guidelines must trigger action by consumers. Focus on Guidelines messages that are active, practical, and positive (2).
- Make the Guidelines more flexible: "each meal is not a diet, each food is not a meal."
- Review nutrition education research to get a better understanding of how population groups understand and interpret nutrition information. Test Guidelines messages with an audience diverse in age, ethnicity, and educational level to determine if intended meanings are interpreted correctly.

Process:

- Conduct one or more public hearings as part of the Dietary Guidelines Advisory Committee's information-gathering phase.
- Make focus group research available to interested parties for comment.

Implementation:

- Give careful consideration to the impact that the Dietary Guidelines will have on child nutrition and the school meal programs.
- Make the Guidelines attainable to help schools offer and serve appropriate meals to children that they will eat.
- Make the Guidelines the rule for government feeding programs, e.g., produce purchases under the WIC Program.
- Consider the challenges of Guideline implementation.
- Incorporate Dietary Guidelines into the evaluation of *The Foods of Minimal Nutritional Value* for school nutrition programs.

Healthy Weight

Scope:

- Guideline should recognize that obesity is the major contributor to chronic disease in America.
- Help individuals take personal responsibility for achieving their ideal body weight through proper diet and adequate physical activity. (2)

Content:

General-

- Keep wording from 1995 weight guideline.
- Re-title weight guideline to say, "Achieve a healthy weight."
- Increase emphasis on physical activity. (3)
- Encourage people to comprehend and apply the basic principles of scientific nutrition to their daily life.
- Clearly communicate guidance on how to maintain weight within a healthy range.
- Focus on promoting health at every size, not slenderness as a prerequisite for health and happiness.
- Be specific with practical guidance on which foods are low in fat.
- Guidance that supports the use of a variety of fat-modified and calorie-modified products may help.
- Use a weight chart with separate gender and age information to avoid confusion.

Children-

- Address both food intake and physical activity patterns to reduce the prevalence of obesity among the young.
- Do not include a separate Body Mass Index (BMI) table for children; it could spur inappropriate dieting and eating patterns.
- Separate Dietary Guidelines for adults and children.

Communication:

- Clarify the message. Focus groups revealed that consumers do not understand the message to "maintain or improve weight."

Implementation:

- Recommend that Federal Government campaigns be more aggressive regarding overweight and obesity.

Physical Activity

Scope:

- Include a separate physical activity guideline.
- Encourage people to comprehend and apply the basic principles of scientific nutrition to their daily life.

- Help each individual to take personal responsibility for the regulation and control of his or her ideal body weight through proper diet and adequate physical activity.
- Continue to reflect the interrelationship of physical activity and sound nutrition.

Content:

- Strengthen the language regarding the importance of physical activity.
- Strongly convey the role of physical activity in preventing obesity, assisting in weight maintenance and reducing chronic disease risk.
- Prominently position recommended amounts of daily activity in the Guidelines and Food Guide Pyramid.

Variety

Scope:

- Should remain cornerstone of guidelines (2).
- Emphasize total diet; all guidelines are equally important.
- Retain the 1995 wording for the guideline (2).
- Keep variety in the diet as the focus of this guideline. Variety among and within food groups helps to ensure consumption of a more complete complement of RDAs for essential nutrients.

Content:

Food Guide Pyramid-

- Don't include illustration of the Food Guide Pyramid, as it has never undergone a scientific evaluation.
- Include the Food Guide Pyramid in the guidelines.

Balance and Moderation-

- Guidelines recommending variety, balance, and moderation are not specific enough anymore, particularly regarding meeting current fruit and vegetable recommendations.
- Refine variety message to emphasize most healthful, nutrient dense foods like fruits and vegetables.
- Shift focus from content of dietary intake to a balance of content and total quantity of dietary intake to compensate for the newer high-energy, low-fat products and to reverse confusion over what to eat to achieve a healthy weight.
- Focus on balance rather than intake for minerals such as calcium and iron.

Nutrient Density-

- Emphasize eating nutrient dense foods (fruits, vegetables, legumes, nuts/seeds, grains) daily; mention fortified foods if dieting, skipping meals, or under changing nutrient requirements.
- Focus on eating a variety of “healthful” foods rather than simply a variety of foods. Currently the Dietary Guidelines provide weak recommendations and foster disease.
- Encourage reduced risk of disease by use of vegetables, fruits, whole grains, and legumes as staples, or by reducing or eliminating meats, dairy products, and fatty foods.

Vegetarian Diets-

- State that American animal-based (meat & dairy) diets promote diet-related diseases; vegetarian diets promote disease reversal.
- Recommend a gradual transition to a vegan diet.
- Include vegetarian diets as a healthy alternative.
- Advocate the adoption of vegetarian/vegan diets by acknowledging their suitability and promoting their healthful advantages (2).
- Recommend vegetarianism; vegetarians are slimmer and healthier than meat-eaters and suffer lower rates of obesity-linked diseases.
- Update and expand information on protective benefits of vegetarian diets and on plant sources of protein for those following these diets.
- Strengthen commitment toward wholesome plant-based diet.
- State what is known in the science about the benefits of plant-based diets.
- Urge Americans to replace meat-derived protein with plant-based protein.
- Include “fortified meat alternatives” in text boxes as a choice in the Meat and Beans group and as a good source of iron. In the vegetarian section, list vegetable-based products, soy foods, and fortified meat alternatives.

Specific Foods/Nutrients-

- Address health differences between animal products and vegetable/grain sources of protein and calcium.
- Recommend that Americans consume more fruits, vegetables, whole grains, but not at the expense of foods like red meat that provide key nutrients deficient in Americans’ diets.
- Resist giving blanket advice for all Americans to avoid eating one food, e.g., eggs.
- Focus on minerals such as calcium, iron, and chromium.

- Stress the importance of obtaining most of one’s nutrition from whole foods and the importance of a diet that contains adequate fiber.
- Include discussion on the crucial role of under-consumption of non-sodium dietary electrolytes in elevating the risk of high blood pressure and the importance of maintaining the recommended 150 mcg iodine per day, particularly for women of child-bearing age.

Calcium Intake-

- Recommend a guideline to increase consumption of calcium-rich foods.
- Note that supplements are not complete and adequate substitutes for dairy foods.
- Retain wording that emphasizes adequate intake of calcium and dairy products as an excellent source of calcium.
- Address the issue of lactose intolerance (4).
- Address lactose intolerance and chronic, diet-related disease.
- For vegetarians and those who don’t tolerate lactose, include “dairy analogs” and make recommendation “0 to 3 servings” (2).

Supplements-

- Recommend that most people take an ordinary multivitamin and mineral supplement to ensure that they get enough folic acid, vitamin B-12, and vitamin D. Advise people who do not consume sufficient calcium from foods to take a calcium supplement.
- Focus on supplements containing vitamins or minerals which occur in foods and for which there is a DRI. Use a broad definition for term “fortification” and don’t try to distinguish it from “enrichment”.
- Encourage non-supplement users to select a better diet and take supplements or consume fortified foods, rather than discouraging supplement users from taking them.
- It is misleading to recommend supplements only for people with special nutritional needs as in the 1995 edition.
- Recommend that the diet be supplemented with vitamins and minerals which are hard to obtain (e.g., calcium, vitamin D, folic acid, vitamin B12 and vitamin E) when it is not possible to eat right.
- Consider a statement about the use of dietary supplements in the dietary guidelines.
- Note that supplements can be an important source of nutrients difficult to obtain from diet alone.
- Mention that supplements provide an advantage in thwarting morbidity/mortality of chronic disease.

- State that Americans should strive to meet their nutrient needs through foods rather than supplements, although there are instances where recommending supplements are warranted.
- Emphasize consumption of whole foods and caution against use of nutrient supplements as a primary strategy for disease prevention.
- Retain 1995 Dietary Guidelines language on supplements while recognizing sub-population needs.
- Do not add a separate guideline on supplements. It could be confusing and potentially unsafe if misunderstood/misapplied because regulatory environment lacks controls.

Functional Foods-

- Consider addressing functional foods.
- Help Americans understand functional foods and how they can promote optimal health.

Communication:

- To lessen consumer confusion, change wording to “Choose foods from each of the five food groups and vary your choices.” (2)
- Don’t change wording of 1995 guideline based on results of a single consumer study.

Implementation:

- Include a special recommendation to replace meat-derived protein with plant-based protein in the National School Lunch program.

Grains

Scope:

- Maintain current recommendation of 6-11 servings of grain-based foods/day as a foundation of a healthy diet (2). Keep grain products at pyramid base.
- Emphasize that refined and enriched, as well as whole grain products, are a nutritious part of a healthy diet (2).
- Increase emphasis on grains and whole-grain foods (2).
- Include a separate grains guideline (2).
- Combine with Variety guideline to recommend a diet based on a variety of plant-based foods.
- Emphasize variety and minimal processing. Give first priority to plant-based foods.

Content:

General-

- Include a discussion of vegetarian diets in this guideline.
- Consider more clearly defining complex carbohydrates and benefits of carbohydrates to consumers.

- Call increased attention to portion sizes of grain products.
- Encourage increased consumption of grains. However, text should identify that a plant-based diet can (and should) include meat.

Whole Grains-

- Increase emphasis on whole grain products in the Dietary Guidelines (4).
- Emphasize importance of increasing consumption of whole grain products to increase intakes of dietary fiber and other nutrients, such as vitamin E (2).
- Recommend people consume 3 daily servings or 1/2 of their grain group servings as whole grain (4).
- Include advice about how to identify and choose whole grains.
- Add whole to Dietary Guidelines wording and to Box 9, page 25 of booklet.
- Do not quantify a recommendation on whole grain consumption.

Enriched and Whole Grains-

- Consider the need to increase intake of enriched and whole grains among the general public.
- Encourage consumption of folate fortified enriched grains as well as whole grains.
- Emphasize the importance of eating a variety of both enriched and whole grain foods as the foundation for healthful eating. Use the wording “Choose a diet built on a variety of grain foods.”

Glycemic Index-

- Consider using the glycemic index as a rating for carbohydrate foods. Pasta reacts similarly to whole grain foods when it comes to insulin (insulin score) and blood glucose (glycemic index) responses.

Fruits and Vegetables

Scope:

Increase Emphasis-

- Supports increased emphasis on fruits and vegetables within guidelines.
- Endorses a prominent fruit and vegetable guideline.
- Position the fruit and vegetable guideline as the most important guideline (2).

Separate from Grains-

- Create a prominent guideline for fruits and vegetables, separate from grains; emphasize fruits and vegetables at the center of Americans’ plates.

- Increase prominence of fruits and vegetables in Dietary Guidelines. Separate advice about fruits and vegetables from that advice on grains; supports whole foods as best way to maintain health; mention in Dietary Guidelines how fruits & vegetables can help consumers achieve the fruit and vegetable objective.
- Consider a Guideline just for fruits and vegetables; place fruits, vegetables, and other plant-based foods at core of Dietary Guidelines.
- Supports inclusion of a separate fruits and vegetables guideline.
- Agree with 1995 grains, fruits, and vegetables guideline.

Combine with Variety Message-

- Give first priority to plant-based foods. Emphasize variety and minimal processing.
- Combine with Variety guideline to recommend a diet based on a variety of plant-based foods.

Content:

General-

- Urge Americans to double their fruit intake.
- Advise a specific minimum number of servings for fruits and vegetables.
- Separate recommended numbers of servings of fruits and vegetables from those for grains and beans.
- Encourage increased consumption of fruits and vegetables. However, text should identify that a plant-based diet can (and should) include meat.
- Base of the pyramid should emphasize fruits, vegetables, legumes and nuts because of their protective effect against cardiovascular disease, cancers, other chronic diseases.
- Include a discussion of vegetarian diets in the text for this guideline.
- Include phenolic compounds in listing of antioxidant nutrients and in discussion of “other substances found in plant foods,” and include a list of known sources.

Consumption of Fruit Juices-

- Make stronger recommendations on the consumption of citrus fruits and citrus fruit juices.
- Fruit and fruit juices should not be considered equal.
- Mothers should be encouraged more to begin feeding orange juice to infants at 6 months of age.

Communication:

- Separate the fruits and vegetables guideline from grains to help communicate the “fruits and vegetables first” message without compromising the importance of grains.

- Suggest wording of “Enjoy meals and snacks with plenty of vegetable and fruits” based on message testing with consumers (2).

Implementation:

- Emphasize the importance of fruits and vegetables in a healthy diet in Federal food and nutrition policies and programs.

Food Safety

Format:

- Try using a question and answer format to discuss this issue.

Scope:

- Empower consumers to handle food safely via the Guidelines and other nutrition education vehicles.
- Include a separate food safety guideline.
- Instead of a separate guideline, add an informative and unalarming food safety message.
- Do not include a separate food safety guideline; it is too complex a subject to be adequately covered in one guideline.
- Keep the Dietary Guidelines solely nutrition-based and separate from food safety messages.
- Adding food safety to the Dietary Guidelines would confuse the public.
- Expanding the Dietary Guidelines would cause them to lose their simplicity.

Content:

Fight BAC! Campaign Messages-

- Incorporate the four concepts used in the Fight BAC! campaign (clean, separate, cook, and chill) which are already being used effectively for food safety education.

Cooking Temperatures-

- Add information about internal meat temperatures when cooking.
- Note that USDA and the FDA have published cooking temperature guidelines that differ.

Foodborne Illness Incidence-

- The food industry contests CDC figures concerning the number of deaths and incidences of foodborne illnesses.
- Focus message on risks faced by those consumers who are especially vulnerable because of age or health status.

Food Handling-

- Focus message on safe food handling practices in the home.

Processed Foods-

- Include warnings about raised or processed foods (e.g., meats) where the feeding and processing creates dangers, and for fish and seafood which are known to have harmful levels of chemicals and heavy metals.

Pesticides-

- Emphasize that the legal use of pesticides has not been associated with any chronic disease, including cancer, or with birth defects.

Implementation

- Note that healthcare institutes are lagging behind commercial establishments in implementing food safety programs.

Fat, Saturated Fat, and Cholesterol

Scope:

- Streamline the message by focusing on total fat and saturated fat. Do not discuss cholesterol, it simply confuses people and detracts from the key points.
- Giving attention to fat reduction as solution to disease prevention diverts attention away from the more important message of shifting to plant based diets.

Content:

General-

- Agree with 1995 fat guideline.
- Make fat guidelines unambiguous. The title should be, "Choose a diet low in fats, especially saturated fat, *trans* fat, and cholesterol."
- Changing from "diet" to "foods" in title implies that there are good foods and bad foods. (3)
- Specify foods, not nutrients.
- Ensure that message is to reduce, not eliminate saturated fat, cholesterol, and total fat.
- Maintain current recommendation on total dietary fat. (2)
- Remove the recommendation about a level of total fat.
- Discuss evidence on dietary fat and cancer.

Quantification-

- Stress limiting intake of saturated fat and cholesterol, and limiting diet to 30% of calories from total fat, in a context of maintaining healthy weight through calorie control and physical activity.
- Emphasize saturated fat and continue total fat target of 30%.
- Do not describe 30% as "low" in fat; moderate is a better descriptor.

- Reduce 30%-fat recommendation and place it in context with other nutrients.
- Specific number, e.g., "30% of energy" gives incorrect presumption of certainty.

Saturated Fats -

- Address saturated fat.
- Saturated fat intake should be no more than 7-10 percent of calories.
- Draw attention to the low Daily Value for saturated fat.

Trans Fats-

- Address *trans* fats.
- Include more information about how much *trans* fat to eat and which foods contain it.
- Emphasize avoidance of food sources of *trans*-fatty acids.
- Provide clear advice about how and why to limit *trans* fat consumption.
- Avoid discussion of which fat - *trans* or saturated - is worse.
- Give consumers some idea of how much *trans* fat to consume.

Cholesterol-

- Include a quantitative recommendation for cholesterol.
- Clarify the confusion about the relationship of egg consumption to cholesterol levels.
- Linkage of an enhanced emphasis on "saturated fat and cholesterol" will give consumers the wrong impression that eggs should be avoided. Scientific evidence supports de-emphasizing any pejorative references to dietary cholesterol.

Other Fats-

- Consider including advice on stearic acid and conjugated linoleic acid in any advice on specific fatty acids.
- Consider including advice on the level of omega-3 fat intake and the balance in omega-3/ omega-6 fats. For improved health, Omega 3 to Omega 6 ratio should be narrowed to about 1:5.

Food Choices-

- Discuss foods that make up a healthy low-fat diet.
- Guide consumers away from meats, whole dairy products, eggs, fried foods, and certain baked foods and toward vegetables, fruits, grains and legumes.
- Add text to limit intake of hamburgers, pizza, whole and 2% milk, french fries, doughnuts, pies, butter, egg yolks and other foods that are high in saturated fat, *trans* fat, or cholesterol.
- Caution against use of excessive added fat. Recommend saying: "If fat additives are used, do so sparingly." (2)

- Emphasize the high levels of fat in many restaurant foods.
- Encourage consumers to eat less red meat.
- Instructing people to avoid or markedly decrease all red meat intake is unnecessarily restrictive; new study shows that lean red meat, as part of Step 1 diet, positively impacts blood cholesterol.
- Margarine should be deleted from box 11 (p. 31) as a choice to choose most often.
- Box 11 should emphasize avoidance of high-fat, high-cholesterol foods and emphasize low-fat and fat-free alternatives.
- Clarify advice about how to identify “lean” meats.
- Report realistic figures for fat content of lean beef.

Children-

- Eliminate the three-year phased reduction in dietary fat. Advice should be strong and clear that a diet moderate in fat (30%) and saturated fat (10%) applies to healthy children over the age of two years.
- Indicate the science base for recommending a transition in the fat level of the diet for children between the age of 2 and 5.

Communication:

- Consumers interpret “diet low in fat” as “no taste, no enjoyment, and not attainable.” However, consumers believe a “moderate fat diet” is achievable.

Sugars

Scope:

Retain 1995 Wording-

- Retain the current wording of the guideline (2).
- There is no scientific basis for the change from 1995 wording.

De-emphasize Guideline-

- Incorporate sugar messages throughout the document rather than isolating sugars into a separate guideline. Advise Americans to evaluate foods/diets on their nutrient, not sugar, content.
- Do not single out sugar as a separate Guideline, but rather emphasize eat it in an overall balanced diet and with getting adequate physical activity as a means of staying healthy.
- Focus on total diet and de-emphasize or drop the guideline on sugar; emphasize the importance of physical activity.
- Place Guideline in “second tier” based on its importance in diet.

Strengthen Advice-

- Current advice is weak given increasing levels of current sugar intake. Recommend specific limits on sugar intake.
- Change wording to “Choose a diet low in added sugars.”
- Agree with the direction the DGAC is taking (e.g., emphasis on added sugars).

Content:

General-

- Note the high levels of added sugars in restaurant foods.
- Disagree that consumption of sugars is increasing rapidly and resulting in an increase in calorie intake; consumption has remained stable as percent of calories and percent of carbohydrates.
- Note association between sucrose and calcium excretion and kidney stones.
- Soft drinks can be part of a balanced diet. Flavoring of beverages may increase fluid consumption, to help prevent dehydration.

Added Versus Naturally Occurring Sugars-

- Distinguishing added and natural sugars would not help consumers and could have a negative nutritional impact.
- Clearly distinguish between foods w/ added and naturally occurring sugars because of displacement issues (e.g., soda replacing milk) and added sugars contribution to various diseases (e.g., obesity, heart disease). Discuss ability of foods high in added sugars to squeeze healthier foods out of the diet.
- Strengthen advice to limit consumption of added sugars. Consumption of added sugars is much higher than recommendations and is increasing.
- Do not increase emphasis on added sugars because added sugars are not different from naturally occurring sugars (2).

Nutrient Displacement-

- Note that added sugars have little to no meaningful effect on diet quality; research shows that added sugars do not displace key micronutrients or food groups.
- The scientific validity of the “nutrient displacement” theory is questionable.
- Specify whether the basis for focusing on added sugars is the displacement issue or possible detrimental health effects. Explain the scientific basis for either.

Sugar and BMI/Obesity-

- Strengthen the physical activity message since research has shown that no single dietary component (including sugar) contributes to increased Body Mass Index (BMI) among children.
- Ignore the “flawed” research study on sugar intake and BMIs.
- Recognize the complex etiology of obesity, not linked to one dietary component. Note that sugar is not causal in heart disease and not linked to nutrient density of diet.
- Note that there is no association between added sugars intake and BMI in adolescents.
- Note that there is no association between obesity and added sugars intake, and energy density appears inversely related to BMI. Only at the highest levels of added sugars intake is there any negative effect on nutrient adequacy.

Sugar and Diabetes/Cancer/Other Chronic Diseases-

- Neither soft drinks nor sugar cause diabetes or other chronic diseases.
- Scientific evidence doesn’t support link of sugars with chronic disease or obesity.
- Key factors in insulin resistance are sustained positive energy balance leading to obesity, physical activity, aging, and genetics.
- Scientific evidence does not support a relationship of sugars to cancer that cannot be explained by total energy intake.

Terminology/Definitions-

- Tell consumers how much “moderate” is.
- Clarify definitions for sugar and sweeteners and standardize information in sugar databases before drawing conclusions about sugar intake estimates.
- Use correct and precise terminology when discussing sugar and sugars (2).
- Harmonize guidance on sugars with FDA food labeling regulations. Changing definitions have led to inflation of the amount of sugars people reportedly consume.

Glycemic Index-

- Avoid discussion of glycemic index (2).

Sugar Substitutes-

- Add acesulfame potassium to the list of sugar substitutes in the text.
- Remove mention of sugar substitutes, as their safety is a matter of continued investigation and disagreement.

Communication:

- Note that consumer research has shown that adults believe sugar-containing foods in moderation can be part of a healthy diet.
- “Foods and beverages with added sugars” does not accurately describe sweet foods and drinks to consumers. Further message development should be conducted and potential messages tested with consumers to assure clarity.
- Word guideline to emphasize using sugars sparingly. Replace the words “choose” and “moderation.”
- Proposed wording will send the message that these foods are bad for you; retain the 1995 wording that sugars in moderation can be part of a healthy diet.
- Proposed change in wording will confuse consumers; it will be perceived as a reversal in fat and sugar messages.

Salt

Scope:

- Agree with 1995 sodium/salt guideline.
- Agree with direction committee is taking.
- Eliminate the sodium guideline, it does not reflect current knowledge. (3)
- Re: Scope of DGAC Report: Recommend that Secretary of HHS initiate action by FDA to revise the NLEA nutrition label from “sodium” to “salt.”

Content:

General -

- Change title to “Choose a diet low in salt and sodium.”
- Clearly and explicitly recommend no more than 2400 mg sodium per day. Consumers do not understand the word moderate. (2)
- Elaborate on the prevalence of higher than optimal blood pressures and evidence linking salt to blood pressure.
- Emphasize the safety and benefits of lower-salt diets.
- Strongly recommend DASH diet, which contained approx. 3 gm sodium per day, as the primary public health strategy to combat hypertension.
- Include discussion that overweight and heavy alcohol consumption contributes more to elevated blood pressure than salt intake.
- Exercise care not to describe the 2,400 milligram Daily Reference Intake of sodium as a “recommendation.”
- Discuss evidence that sodium restriction improves “health outcomes” not whether sodium restriction is “safe.”
- Emphasize calcium loss due to high sodium diets.

- Maintain an emphasis on sodium, not other nutrients.
- Ensure that advice about sodium applies to children (2).

Food Choices-

- Urge consumers to buy foods that are labeled “healthy”.
- Urge consumers to buy unprocessed foods.
- Emphasize the high levels of sodium in many restaurant foods.
- Encourage Americans to limit sodium and protein as an important means of conserving calcium stores.
- Meal planning tips (Box 15) should encourage the use of sodium “sparingly” in the diet.
- Note that the highest-sodium products are canned goods (prepared with added salt) and snack foods, and that animal products are higher in sodium than plant foods, unless salt is added.
- Discourage the use of salt added in cooking or at the table, as opposed to the vague advice “use small amounts.”

Communication:

- Consider using consumer focus groups to ensure comprehension. (2)
- Determine whether the focus is salt or sodium and craft an understandable message to communicate the issues.

Alcoholic Beverages

Scope:

- The guidelines should not promote the consumption of alcohol.
- Avoid wording that would provide new marketing opportunities for the alcoholic beverage industry.
- Craft message carefully with a large safety margin to avoid misinterpretation.
- Recommendations should focus on age differences and alcohol effects, medication interactions and the elderly, pregnancy and lactation, and breast cancer.
- Language of moderate drinking should be carefully worded to give accurate public health message.
- Strengthen cautionary language while presenting balanced, science-based information about alcohol that addresses adverse and beneficial effects.(2)

Content:

General -

- Agree with 1995 alcohol guideline.
- Drop any mention of alcoholic drinks as a food or a drug until the liquor industry adds ingredient labels and lot identification numbers to its products and until there is a scientific consensus that indisputably documents the benefits of moderate drinking by a randomized, double-blind, placebo-controlled trial.
- Include an explicit statement that it is not recommended that anyone begin or increase drinking for health reasons.
- Include accurate and complete information about the effects of alcohol consumption, distinguishing moderate consumption from abuse and encouraging responsible choices.
- State that the research to date has not yet proven that the potential health benefits outweigh the risks.
- Delete the sentence: “Alcoholic beverages have been used to enhance the enjoyment of meals throughout human history.” (2)
- Retain the sentence: “Alcoholic beverages have been used to enhance the enjoyment of meals throughout human history.” (2)
- The reference to eating when consuming beverage alcohol should refer to “food” rather than just “meals.”

Risks-

- Identify the risks associated with moderate alcohol drinking.
- Strengthen the existing language in order to accurately reflect the evidence that moderate alcohol consumption of alcoholic beverages substantially reduces cardiovascular risk and overall mortality, and that these benefits apply to the majority of the population.
- Include a caution on breast cancer risk. (2)
- Address risk of abuse, ie. “The earlier someone begins to drink, the greater the risk of eventual addiction.”

Moderation-

- The word “moderate” should be replaced with a specific recommendation to consume no more than one drink per day. (2)
- Recommend this wording for the guideline, “If you drink alcohol, women and all persons 65 and over should consume no more than one drink per day, and men under 65 no more than two drinks per day.”
- Do not include a warning to avoid more than one drink per day. The evidence demonstrates net benefits at higher consumption levels than one drink per day.
- Define moderate drinking and list the five groups of people who should not drink under any circumstances.

Heart disease-

- Inform the public that: the science is not conclusive as to causality regarding coronary heart disease (CHD) risk reduction; there are studies showing CHD risk reduction at levels of alcohol consumption far below moderate; very serious negative health consequences quickly accrue at levels of consumption above moderate.
- Clarify language about and be specific about which populations might benefit from moderate drinking. (2)
- Highlight alternatives to alcohol consumption as a way of reducing CHD risk.

Children, Adolescents and the Elderly-

- Include a special alert regarding alcohol and young people.
- Children and adolescents should remain under category of "who should not drink," but discussion of risks of early onset drinking should be limited to abusive drinking.

- Include a special caution regarding alcohol and the elderly.

- Disagree with statement that moderate consumption provides "little or no benefit" for younger people, the elderly, and for those not at high risk for CHD.

Alcohol Serving Size-

- Definition of a "drink" should make reference to differences in actual serving sizes.
- Conversion factors used for beer and wine equivalents overstate the actual alcohol content of these beverages and should be reassessed.
- At a minimum, change the distilled spirits component serving size to 1.5 ounces.

